WEEDS TREES & TURF

ONE DOLLAR • MARCH 1977

Keeping power highways clear

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Chemical lawn care marketing

Tank mixing pesticides

Knotweed, poison ivy, thistle fade out of the picture when DACAMINE® comes in.

Dacamine turf herbicide kills weeds, roots and all . . . not just the tops.

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And, Dacamine is non-volatile, even in hot weather . . . an important advantage when spraying near ornamentals. Just avoid spray drift and follow label directions.

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The resourceful company.

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WEEDS TREES & TURF®

MARCH 1977, Vol. 16, No. 3

14 The Wonderful Power of Selectivity to Power Line Rights of Way — Public awareness of environmental quality and land use adds a new dimension to maintaining power highways.

18 Transplanting Tolerances of Seven Tree Species — Here are the results of a study conducted at Memphis State University on transplanting effects on species of cypress, ash, maple and oak.

20 Tank Mixing Pesticides for Effective Results — This time and labor saving method of application is most successful if precautions are taken.

24 Lime Applications for Soil Neutralization — Here is some practical advice for improving the pH rating of your soil for better turfgrass.

SPECIAL PULL-OUT SECTION — Chemical Lawn Care Industry — This in-depth look at a billion dollar industry covers everything from marketing to management including a survey of the industry, a look at several successful companies and some practical advice for improving your lawn care business.

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ON THE COVER—**One important aspect of providing sufficient electric power is proper maintenance of power rights of way. For the newest developments in this area see page 14.**

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Member, American Business Press, Business Publications Audit ABP BPA

Single Copy Price: $1.00 for current and all back issues. Foreign $1.50. Subscription Rates: WEEDS TREES AND TURF is mailed free, within the U.S. and possessions and Canada, to qualified persons engaged in the vegetation care industry and related fields in controlled circulation categories. Non-qualified subscriptions in the U.S. and Canada are $10.00 per year; other countries, $12.00 per year. Controlled circulation postage paid at Cleveland, Ohio 44101.

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TO OUR READERS —

This issue marks our first in-depth look at the emerging lawn care industry. When we first discussed the possibility of a supplement we knew: A. there was such a business; B. the names of three of four large companies; and C. one reputable tree company that was expanding its share of the lawn care market. Today we know a whole lot more.

Our information was gathered from a special WT&T survey mailed to over a thousand lawn care industry people, a telephone survey conducted for us, and from extensive investigation by the staff. Assistant Editor Eric Friedman, alone, talked with over one hundred lawn care industry people.

Although it is impossible to personally thank each of the people who helped us compile our information, we would like to extend thanks to the following individuals: Daniel Dorfman, founder of Lawn-A-Mat; Anthony Giordano, founder of Lawn Doctor; Dr. Robert Miller, vice president of research and development for Chem-Lawn; Dr. Roger Funk, director of research at The Davey Horticultural Institute of the Davey Tree Expert Co.; Marty Erbaugh, head of the Davey landscape division of the Davey Tree Expert Co.; and Dr. David Harmon, director of research for Harvest Publishing.

All of the factual information we gathered appears in our supplement. But perhaps the one important aspect our supplement does not stress enough is the importance of quality service. Lawn care is a service-oriented business. No amount of advertising will erase incompetent work. And one of the most important sales tools available is the satisfied customer. This all leads me to an important point — the need for a professional organization.

A professional association can upgrade an industry. It can be a vehicle for the exchange of developments and ideas, and for setting standards for quality and performance. We urge lawn care industry people to form such an organization and extend an offer to help in the formation.

If you are in the lawn care business and agree with us, won't you write to us, expressing your opinions on how the organization should be formed, what its goals should be, and if you would be willing to play an active role in such a group. We will keep you informed as to the developments in this area through this editorial page in future issues.

Recently we received the following letter:

Gentlemen:

Congratulations on your superb articles concerning irrigation in your January '77 issue. They were not only well written but extremely informative for those who are in the process of evaluating their irrigation needs.

I have one comment to make and this is, if at all possible, in the future could a footnote be added to the end of each article where the reader can write and obtain further information pertaining to the subject material.

Fred Wilochka
Aqua-Matic Lawn Sprinkler and Irrigation Co.
Longmeadow, MA.

We shall make every effort to comply with Mr. Wilochka's request.

And another letter:

Gentlemen:

How about equal time for us Easterners? I refer to the January issue, page 12, in which you plug "Trees of the Berkeley Campus" at $5.00.

"Trees in Amherst" a pictorial and descriptive record of native, cultivated and historically interesting trees in Amherst, Massachusetts; assembled and edited by The Tree Book Committee and published by the Garden Club of Amherst, copyright 1975 is an excellent compilation of text and pictures in a plastic three-ring binder. The index leaves out some essential cross references and is somewhat arbitrary, but the closeups of flowers, bark, seeds, etc. are most unusual and very clear.

G. A. Yarwood
Yarwood & Block, Inc.
Simsbury, CN.

Gail D. Hogan

John Deere Loaders...

Everything you need to get a move on

If your job requires hustle and versatility, you can look to John Deere Loaders for fast, efficient work. You have a choice of detachable or integral loaders in 43-, 50-, or 62-net-hp sizes.

For clean conversion to utility tractor configuration, even the hydraulic controls and hoses come off with the 2500-pound-capacity detachable loader. The loader unbolts easily from two mounting plates.

Integral loaders with ¾- or 1-cubic yard buckets have a standard hydraulic direction reverser for faster cycling.

Ask your John Deere dealer about other loader features such as wet-disk brakes, efficient 3-point hitch system, power steering, and more. He's listed in the Yellow Pages. John Deere, Moline, Illinois 61265.

Single-lever control on integral loaders helps make handling easier.

JOHN DEERE

JOHN DEERE on the move

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Why TERSAN® fungicides give you Total

LEAF SPOT (Helminthosporium spp.) on bluegrass.

DOLLAR SPOT* (Sclerotinia homoeocarpa) on bentgrass.

TYPHULA BLIGHT or Gray Snow Mold (Typhula itoana) on a fairway.

LEAF SPOT on bentgrass (melting-out stage).

LARGE BROWN PATCH (Rhizoctonia solani).

TYPHULA BLIGHT or Gray Snow Mold, close-up view.

RUST (Puccinia graminis) on bluegrass.

FUSARIUM BLIGHT (Fusarium roseum and Fusarium tricinctum).

PYTHIUM BLIGHT or Cottony Blight (Pythium spp.).

TERSAN LSR Turf Fungicide controls Leaf Spot and Rust. It is also effective against Large Brown Patch.

TERSAN 1991 and TERSAN 75 effectively control Dollar Spot and Large Brown Patch. TERSAN 1991 controls Fusarium Blight.

*In order to help reduce the possible development of tolerant strains of dollar spot it is recommended that TERSAN 1991 be used in conjunction with TERSAN 75 or another suitable contact fungicide.

TERSAN SP provides outstanding control of both Typhula Blight and Pythium Blight.

Turf Protection.

You're faced with a lot more than one or two turf disease problems. That's why you need the Du Pont TERSAN program. It gives you protection against just about every disease your course will ever encounter.

But you get more than proven, effective control with the TERSAN program. You get economical control as well. You use just the treatment that works on a given problem. There's no waste. No extra expense. You pay only for the specific treatment to control a specific disease.

And it's more effective. Because you zero in with prescription precision on specific diseases. You use one right treatment applied at the right rate at the right time to achieve the most effective control.

So, if you want to keep your course greener for less money, use the TERSAN turf disease control program. It's the best way to obtain total turf protection against most disease problems. For complete details, contact your chemical supplier—or mail in the coupon.

With any chemical, follow labeling instructions and warnings carefully.

E. I. du Pont de Nemours & Co. (Inc.)
***TERSAN* TURF PRODUCTS**
Room 24933
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Please send me a copy of your new booklet "How To Keep Your Course Greener for Less Money."

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Course/Firm_____

Title_____

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Government News

Regulation of pesticides by the Environmental Protection Agency and, less directly, industry data supporting pesticide registrations and tolerances have been sharply criticized by a Senate subcommittee staff report, the result of an intensive study of the agency conducted last year.

An agency official said "it is probably the most devastating report to hit EPA since it was formed."

The draft report, "The Environmental Protection Agency and the Regulation of Pesticides," stated the inquiry has led to the "unfortunate but clear conclusion that pesticide regulation in the United States is fundamentally deficient."

The report continued:

"Pesticide regulation has failed to include many obvious, necessary and prudent steps that would have better protected the public health and the environment. Moreover, the failure of pesticide regulation is not attributable in any significant way to deficient legislation. Rather the cause lies clearly and unmistakably with the poor administration of the program by the EPA itself. In an almost classic example of poor Government regulation, the EPA's handling of pesticide registration has sacrificed effectiveness at the altar of bureaucratic neglect. For six years, EPA has paid too little attention to warnings of Government investigators, congressional reviews, and even some of its officials."

The staff concluded that a large part of the millions appropriated for pesticide regulation by EPA have been wasted.

EPA issued a USDA exemption to use dimethoate, Guthion, and malathion to control citrus blackfly in Florida's Broward, Dade, and Palm Beach Counties. Maximum allowed use is 45,000 gallons of 95 percent malathion; 1,000 pounds of dimethoate; and 450 pounds of Guthion. Application sites are limited to nursery stock, urban areas, and, if necessary, commercial citrus groves. The exemption expires October 1, 1977.

A recent District Court decision that allowed an employer to require an OSHA inspector to fill out a questionnaire before inspecting the premises has been reversed by the Appeals Court. The Appeals Court says the questionnaire is "patently designed to delay inspection." OSHA inspectors need only to present credentials to be admitted.

The petition for rehearing in the Heptachlor/Chlordane suspension appeal was denied by the U.S. District Court of Appeals. The petition was submitted by Velsicol Chemical Co. In the meantime, cancellation hearings continue.

Outfit your course with new Standard tee consoles

...at no cost to you!

Imagine new, colorful Standard Golf tee consoles on your course that didn't cost you a cent. It's possible with Standard's special tee console donor program. All that is needed is one donor per console. The donor (could be a banker, insurance agent, auto dealer, etc.) pays you the price of the console — and in return gets his name attached to the console as shown above.

The distinctive donor sign is available from Standard Golf and fastens to the bottom of the Tee-Data sign (wording is limited to three lines, 22 spaces per line). Why not start lining up some donors now for new Standard Golf tee consoles for your course.

Remember—just one donor per hole will go a long way in helping your equipment budget—and will make your players happy, too!

Need more information? Contact your local Standard distributor. Or write or phone:

Standard Golf Co.,
220 East Fourth Street,
Cedar Falls, Iowa 50613.
Phone 319/266-2638.

STANDARD GOLF Pro-Line

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THE GREEN MACHINE

VICTOR 800

This is the machine that revolutionized the turf industry ... the machine that seeds or sprigs, fertilizes, waters, sprays, and mulches in one easy operation . . . the Bowie Hydro-Mulcher.

Its performance and reliability are unequaled. Its capabilities have created a whole new industry of lawn and turf, ground cover and erosion specialists. The Bowie Hydro-Mulcher is the daddy of them all . . . the green machine.

LANCER 350

EXCLUSIVE BOWIE HYDRO-MULCHER FEATURES:

- Only proven unit for both sprigging and seeding with cellulose fiber mulches.
- Can mulch, fertilize and seed or sprig half ar acre in eight minutes.
- Has enclosed shredder bar for shredding full bales of cellulose fibers.
- Has centralized tower control with no hoses.
- Has triple agitators for faster mixing and eliminating sediment build-up.
- Uses pump only for spraying, so pump lasts longer.
- Slurry passes through pump only once, thus reducing seed damage and clogging.
- Has spray mist and other accessory nozzles for such uses as insect control, tree spraying and fire fighting.
- Six models — from 350 to 3,000 gallon capacity.

WINDSOR 1000

CALL OR WRITE FOR COMPLETE DETAILS:

IMPERIAL 1500, 2500 & 3000

HYDRO BOWIE MULCHER

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 Circle 149 on free information card

Industry News

N.H. forest named biosphere reserve

Hubbard Brook Experimental Forest in New Hampshire was recently named a "biosphere reserve", according to a spokesman for the U.S. Forest Service.

The newly-named reserve is part of an international network of protected areas representing the world's major natural regions. In addition to conservation, the areas will be used for research monitoring and education. Five other U.S. sites, all in existing national forests or national parks, were also named biosphere reserves under UNESCO's Man and the Biosphere Program.

Hubbard Brook has served as a watershed research site since 1955, said Robert S. Pierce, Forest Service research forester at Durham, NH. Located in the central White Mountains near West Thornton, Hubbard Brook is typical of many watersheds in New England. That, and the fact that its vegetation is representative of northern hardwood forests, make it an ideal site for research.

Plant to make gas for NH_3 production

W. R. Grace & Co., and Ebasco Services Inc., both of N.Y., NY, will negotiate a contract with the Energy Research and Development Administration (ERDA) to design a demonstration plant for the gasification of coal for generation of synthesis to produce 1,200 tons per day of ammonia.

The plant will be designed to demonstrate the utilization of a wide range of U.S. coal, including high sulphur eastern coals. All local, state and federal environmental requirements will be incorporated in the plant design.

At the conclusion of the Phase I design, predefined performance and economic criteria for the facility will be established. These criteria will be the basis for determining whether the proposals will continue to Phase II (construction).

Current plans are to locate the proposed coal-base ammonia plant in Basket, KY, in the vicinity of the Green River, six miles from Henderson, KY.

Fisons expands research area

Fisons Corporation has purchased a 300-acre research farm near Harlingen, TX. The farm will be used for specialized testing and screening of herbicides, insecticides, and fungicides produced by Fisons research and development facility in the United Kingdom.

The purchase of the Harlingen research facility is the second major physical expansion for the firm in the past year. The company recently began construction of a pesticide manufacturing plant on a 435-acre site near Muskegon, MI.

Fisons Corporation, headquartered in Bedford, MA, is a subsidiary of Fisons Limited, England, a world-wide manufacturer and marketer of agricultural chemicals, fertilizers, pharmaceuticals and scientific equipment. Fisons Corporation has been conducting agrichemical research in the US since 1967.

According to Fisons, the Harlingen location was selected for its year'round growing season, enabling the testing of products on a wide variety of crops.

Diamond Shamrock shows record sales

Diamond Shamrock Corp. achieved record sales, net income and earnings per share for the fourth quarter and fiscal year 1976. The announcement was made by W. H. Bricker, president and chief executive officer of the diversified chemicals and oil and gas company.

For the 12 months ending Dec. 31, 1976, net income increased 22 percent to $140.0 million compared with $114.3 million in 1975.

Earnings per share were $3.90 based on 34,547,000 average common shares outstanding. This compares with $3.41 based on 31,344,000 shares outstanding in 1975.

Record sales totaled $1.36 billion, up 20 percent from 1975.

New insecticide mfg. firm opens

The formation of Fairfield American, a corporation whose insecticide products were formerly made by the agricultural chemical division of FMC Corp. of Middleport, NY, has been announced by Clinton J. Starke, the new firm's president. Starke was formerly manager of industrial sales at FMC.

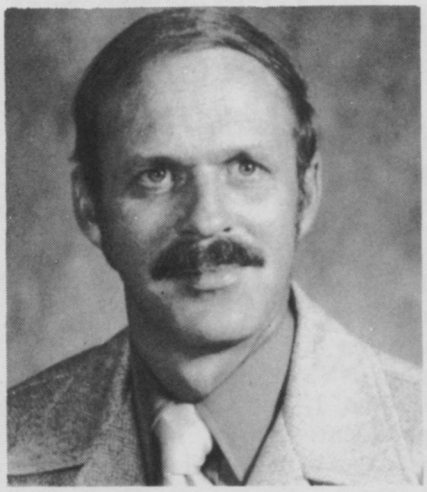
Johns-Manville forms Ag-Turf dept.

The Johns-Manville Corp. is consolidating its agricultural and turf irrigation sprinkler systems business in Fresno, CA, under the name Ag-Turf department. The announcement was made recently by Chester J. Sulewski, senior vice president, industrial and pipe products group.

According to Sulewski, this consolidation will enable the Ag-Turf department to be more responsive to customer needs and to better serve the irrigation market.

People on the Move

James H. Lake has been named president of **Elanco Products Co.,** a division of Eli Lilly and Co. Lake received a B.S. from Bucknell University. He joined Lilly in 1949 and became assistant director of pharmaceutical production in Indianapolis and later director of the Tippecanoe Laboratories in Indiana. He has also served as general manager of the Tippecanoe and Clinton facilities, vice president of the biochemical division and most recently served as vice-president of production operations.



John Sours

John Sours has joined the turf marketing department of the **Jacklin Seed Co.** Sours holds a B.S. in land and water resource development from Michigan State University.

David Simpson has been named technical representative for the Pro-Turf division of **O. M. Scott and Sons** in the Canadian territory east of Toronto. Simpson has extensive background in golf course construction and irrigation.

Paul Dexter, formerly senior market research analyst and district sales manager for the agricultural department of The Dow Chemical Co., has joined **Agrotec Services, Inc.,** Salisbury, MD, as field sales specialist. His duties will include covering Virginia and northeast North Carolina. Dexter holds a degree in business administration from the University of Toledo.

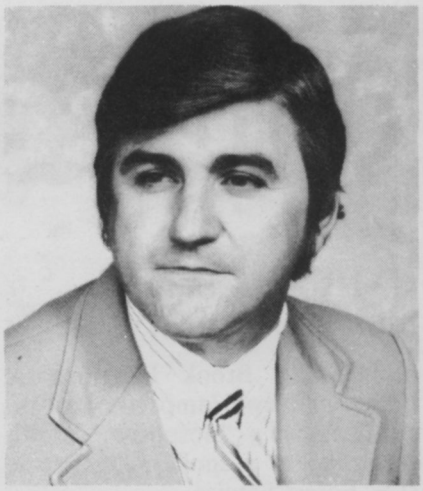
Morgan Howard has been appointed western regional turf sales manager for **Rain Bird.** Formerly the district manager for the southwestern region of the United States for Rain Bird, Howard will now oversee the district managers of the western United States.

Lorne R. Dunham has been appointed division manager of **Cole Chemical Supply** of Madison, Wisconsin. Formerly in product development with Occidental Chemical Co., Dunham will be headquartered in Madison.

Toro Co. announces the appointment of **E. S. Newton Jr.,** as director of sales and marketing for turf products. Newton recently completed a special 18-month assignment as director of turf irrigation sales for Toro's irrigation division. Prior to that, he spent 14 years with Zaun Equipment, Inc. of Jacksonville, FL., a full-line Toro distributor.

Thompson-Hayward Chemical Co. announced four branch manager appointments. **Charles P. Jensen** transfers to the Memphis distribution center as branch manager. **J. L. Smith** moves to Atlanta as branch manager, **Phil Kizer** is promoted to branch manager at the Oklahoma City distribution center and **Ray Gibbs** is promoted to branch manager of the Nashville center.

Jensen joined the company in 1960 as a warehouseman. Later he served as an industrial sales representative, then branch manager in Atlanta.



Charles Jensen

Smith has been with the company for 16 years beginning as an office worker then moved into industrial sales and later served as branch manager in Nashville.

Kizer joined the company in 1962 as a laboratory technician. He later served as an industrial sales representative then manager of product marketing in the industrial chemical division.

Gibbs started with Thompson-Hayward in 1970 as an industrial sales representative, a position he has held until his promotion.

The B. Hayman Co. has added two new field representatives to its sales staff. **Don Rodino** will serve as the company field representative in San Bernardino County, Palm Springs and Las Vegas. **Nick Dykman** will serve eastern Los Angeles and Riverside Counties. Both attended Mount San Antonio College.

Allan N. Pavia has been named manager of materials management of the outdoor power equipment division, **J I Case Co.,** based in Winneconne, WI. Pavia joined J I Case in 1964 at the Racine Tractor Plant and most recently served as a supervisor in materials management there.

Healthy little beauty likes shade!

What a beauty little Glade Kentucky bluegrass has turned out to be! A fine, healthy specimen, Glade has a higher level of resistance to powdery mildew, and performs better than many other Kentucky bluegrasses in up to 60% shade as well as open sun. Glade, a Rutgers selection (nationally tested as P-29), has improved resistance to stripe smut and leaf rust. Midwestern and Northeastern university tests indicate that Glade has better than average resistance to Fusarium blight.

Glade is one of the fastest germinating bluegrasses, quickly forming a thick rhizome and root system. A dense, low-growing, leafy turf, Glade has an attractive medium to dark green color.

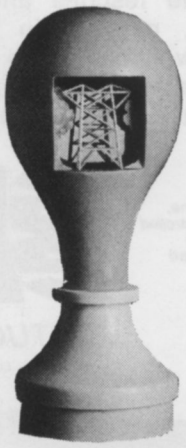
Glade Kentucky bluegrass is your guarantee of physically pure and genetically true seed. You won't be seeding annual bluegrass (*Poa annua*), short-awned foxtail or bentgrass when you plant Glade. Specify this healthy little beauty in your next lawn seed mix. It blends beautifully with fine fescues and other elite bluegrasses, persists in shade when many others weaken. Glade Kentucky bluegrass is available at your local wholesale seed distributor. Insist on Glade in your mix.

Another fine, quality-controlled product of Jacklin Seed Company.

Glade

KENTUCKY BLUEGRASS

U.S. Plant Patent 3151



The wonderful power of selectivity to power line rights of way

by Charles J. Olenik, supervisor of forestry, eastern division, Pennsylvania Electric Company

In recent years there has been an ever increasing demand by homeowners, business and industry for more and more reliable electric service. To accommodate this increased use, companies such as Penelec have constructed new power plants, stepped up voltages on existing power lines, and constructed new and higher voltage transmission and distribution lines to handle the increasing load.

However, having the facilities to generate and carry the energy produced is only part of the aspect of providing reliable service to the customer. New and existing rights of way that are the "highways" of electrical energy must be maintained to prevent any interruption in the flow of energy. Specifically, interruptions caused by trees or brush reaching conductors thereby causing outages and other major and very costly problems.

At the present time, we as right of way managers have numerous synthetic growth hormones that do a reliable job in fighting the encroachment of undesirable tree species on our rights of way. However, we are also facing a fact of increasing public awareness in the areas of environmental quality, ecology, land use and the value of an undisturbed natural landscape.

This fact adds another dimension to the problem of right of way management. That is, we must maintain our rights of way to provide reliable service and at the same time manage these same areas so as to provide an aesthetically pleasing appearance and a land area useful for wildlife and recreation.

The answer to this problem therefore cannot be just any chemical brush control program. There must be some thought and planning to choose a chemical technique that will provide adequate vegetation control and in addition be economical, safe and aesthetically pleasing. To accomplish this goal we should consider some basic factors that are present on all rights of way:

Conditions existing on the right of way

This information must be gathered by a field survey of the right of way, which means we have

to get out and walk and make some observations to determine:

1. Density of undesirable tree species.
2. Density of desirable vegetation.
3. Height of brush to be treated.
4. Terrain.
5. Access.
6. Agricultural activities in and near the right of way as well as state and federal lands that cross the area to be treated.
7. Population.
8. Main road and highway crossing.
9. Stream and river crossings.

Gathering this information is a major part in making a final decision as to the type of chemical technique deemed necessary.

Consideration should be given to the techniques available and the advantages and disadvantages of each as they relate to the field survey. Some of the methods of application used on Pennsylvania Electric Co. property over the years that have been proven effective are:

Selective basal application

1. All woody plant species in the right of way, except species designated to be left for future ground cover, shall be treated with chemical in oil so as to saturate each stem completely at the ground line and to a height of 12 to 18 inches on the stem and completely encircling each stem. Where sprout growth originates from a stump, the treatment shall also be applied completely around the stump and any exposed roots.
2. Extreme care must be taken to treat only the tall growing tree species.
3. All chemical solutions shall be applied by nozzlemen walking the right of way. The applicating equipment may be either power driven equipment or knapsack spray tanks. Spray nozzles shall be adjusted to produce a coarse spray of large droplets at 30 pounds or less pressure.
4. Treatment season shall be year 'round.
5. All evergreen plants, except those listed, shall be treated over their complete height, including all leaves, twigs, and stems, in additions to the basal treatment.
6. All stems of ash species over five feet in height shall be removed by completely cutting at the three-inch height. The brush from this mechanical cutting shall be disposed of in a manner acceptable to the property owner. No burning of this brush will be permitted without the approval of the company. Stumps of this brush to be treated in accordance with specifications for selective basal treatment except for height of treatment.
7. The following plants are not to be treated on the right of way:
   A. All grasses, ferns and herbaceous plants.
   B. All annual weeds and annual plants
   C. Low-growing shrubs including:
      1. Mountain laurel
         Kalmia latifolia
      2. Sweetfern
         Comptonia peregrina
      3. Azalea
         Azalea nudiflorum
      4. Huckleberries
         Gaylussacia spp.
      5. Blackberry
         Rubus allegheniensis
      6. Raspberry
         Rubus occidentalis
      7. Spice bush
         Lonicera benzoin
      8. Choke cherry
         Prunus virginiana
      9. Choke berry
         Pyrus melanocarpa
      10. Dwarf willow
         Salix humilis
      11. Witch hazel
         Hamamelish virginiana
      12. American yew
         Taxus canadensis
      13. Partridge berry
         Mitchella repens
      14. Wintergreen
         Gaultheria procumbens
   D. Small trees to be preserved on the right of way where conductor height will permit:
      1. White flowering dogwood
         Cornus florida
      2. Redbud
         Cercis canadensis
      3. American hornbeam
         Carpinus caroliniana
      4. Shadbush
         Amelanchier canadensis
      5. Iron wood
         Ostrya virginiana
      6. Red cedar
         Juniperus virginiana
      7. Striped maple
         Acer pennsylvanicum
      8. American crabapple
         Malus coronaria
8. All brush over five feet in height, except the above, located within 100 feet of all improved roads and highways shall be cut and stump treated. The cut brush shall be disposed of in a manner acceptable to the property owner and so as not to be visible from the road or highway.
9.

Advantages

1. Selectivity in choosing stems to be treated.
2. Foliage "brown out" can be eliminated with dormant application.
3. Control over application of the chemical solution.
4. Can be applied year round.
5. Most acceptable to the public.

Disadvantages

1. Excessive cost when applied on dense brush.
2. Limitations by terrain and access.
3. May be a problem in obtaining oil.

Water borne, stem-foliage application

1. All undesirable vegetative growth shall be sprayed with a solution of chemical and water so as to completely wet the entire leaf and stem surface until there is runoff; except that evergreen tree species over five feet in height shall be removed by cutting at the three-inch height.
2. Extreme care must be exercised to insure that each plant is entirely covered with chemical solution, both in leaf and stem surface. To accomplish this complete coverage, it is necessary that the nozzleman treat each plant individually from a position close to the plant. Each plant must be treated from more than one direction.
3. All chemical material shall be applied by nozzlemen walking the right of way. The nozzle opening size shall be No. 9 or

Continued on page 16

Continued from page 15

larger. The nozzle pressure shall not exceed 150 pounds pressure. To assure complete coverage of plants on the outer edges of the right of way, it is necessary that they be sprayed by men walking to the edge of the right of way and directing their spray to the center of the right of way. Off right of way damage is not permitted.

4. Pump equipment used to pump or mix spray materials shall not be used to pump water from streams or ponds into spray tanks.
5. Chemical treatment is applied between June 1 and August 15.
6. Chemical treatment shall not be made when there is a danger of wind drift of spray materials causing off right of way damage.
7. Water borne, stem-foliage treatment shall stop at least 100 feet from all road crossings, stream crossings, residences, and agricultural areas and the selective basal application substituted.
8. All brush over five feet in height, except small trees and shrubs, located within 100 feet of all roads shall be cut and stump treated.

Advantages

1. Economical in dense brush.
2. Moderate to good control in dense stands of brush.

Disadvantages

1. Foliage "brown out."
2. Limitations by terrain and access.
3. Less selectivity in choosing stems to be treated.
4. Less control over application of chemical solution.
5. Limitations by weather conditions.
6. Limited time period of application.
7. Water supply may be a problem in some areas.

Application by helicopter

1. Because of the complex nature of this job and the high degree of skill required in this operation, only qualified helicopter pilots with adequate experience in aerial right of way spraying shall be used.
2. It is necessary that all brush on the right of way be treated from two directions parallel with the line in order to overcome the shielding effect of the brush foliage on the forward motion of the spray droplets thus causing lack of treatment from two directions, one-half the prescribed volume of solution will be applied to the right of way by the helicopter flying in one direction; and one-half the volume will be applied by the helicopter flying the same swath in the reverse direction.

   Where the density of brush varies on the rights of way, an effort shall be made to vary the application with the brush density. Side dressing of the trees along the edge of the right of way is not permitted. Damage to trees and other plants off the right of way will not be tolerated.
3. Each property owner on the right of way shall be contacted by the contractor's personnel to obtain consent for helicopter application.
4. Treatment shall be from June 1 and shall be completed before August 15. Application shall not be made when winds exceed five miles per hour.
5. Helicopter application shall stop at least 100 feet from all road crossings, stream crossings, residences, and agricultural areas and the selective basal application substituted.
6. All brush over five feet in height, except small trees and shrubs, located within 100 feet of all roads shall be cut and stump treated.
7. Selective cut areas shall be marked by the contractor so that they can be identified from the air and not treated.

Advantages

1. Economical
2. Effective kill on dense stands of tall brush.
3. Access and terrain aren't a problem.

Disadvantages

1. Foliage "Brown Out".
2. Less control application of chemical solution.
3. No selectivity of application.

the power of selectivity

4. Limitations by weather conditions.
5. Limited time period for application.
6. Disapproval by a larger portion of landowners than with other types of application.

With all the information on hand, a decision can be made so as to complement the conditions existing on the right of way with the proper chemical technique.

In some cases, several chemical techniques may be employed along a single right of way.

As an example, during the 1975 spray year, one 500 KV right of way was treated using different chemical techniques. A right of way survey was completed the previous year and presented a situation where a selective basal application and helicopter application could be properly used along different sections of the right of way

Approximately 270 acres were set up for the selective basal application because of the light to moderate density of brush intermixed with a variety of desirable vegetation. Access to and along the right of way was adequate for men and power driven equipment to accomplish their job with little difficulty. Finally, the areas surrounding the right of way were mainly crop lands and pasture areas. These existing conditions on the right of way dictated the selective basal approach.

Approximately 100 acres of the same right of way traversed remote, steep, mountain ridges and slopes supporting dominant, tall stands of black birch *(Betula lenta)* and black locust *(Robina pseudoacacia)*. Access was limited with the population of the surrounding area being sparse. In this situation helicopter application was a very useful and economical tool to be used without the public disapproval that may have occurred in a more populated or agricultural area.

By using this approach to vegetation management on this particular right of way, as well as others, Penelec has achieved an effective control of tree species without the public disapproval that may result when we disregard all other factors and base an entire spray program on the economic aspect alone. □

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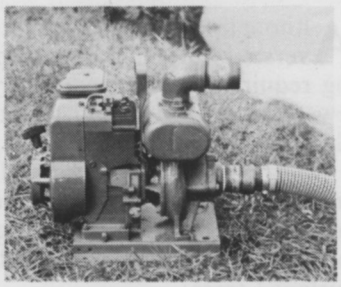

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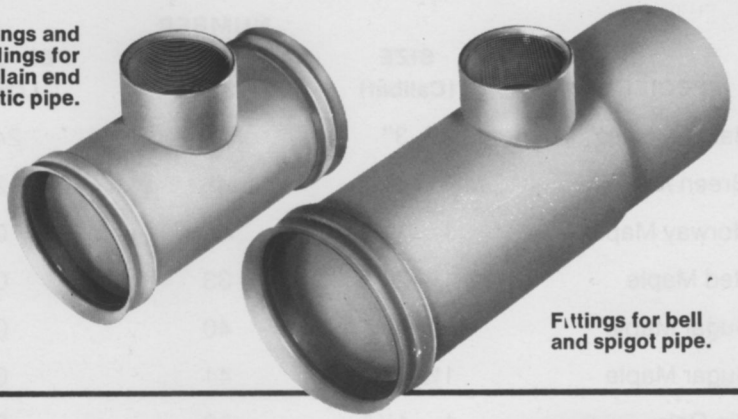

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Transplanting tolerances of seven tree species

by James G. Staley and Jamie Dickson

James G. Stanley is a horticulturist at Memphis State University, where Jamie Dickson is a graduate assistant.

Although there is apparent universal knowledge of transplanting requirements for trees there are few reported articles on tree transplanting research.

Pelton (1966), Crockett (1972), and Baumgardt (1975) listed a detailed account of these requirements as pertaining to balled and burlaped trees.

As far as actual transplanting results, Ford and Foot (1973) reported a 93 percent survival rate of trees and shrubs using a tree spade. Tree sizes ranged from 2 - 7½ inches in diameter. Cool (1975) found that trees transplanted with a tree spade rather than hand methods had less than 5 percent losses as opposed to 31 percent by hand digging.

Van de Werken and Beavers (1965) and Van de Werken and Warmbrod (1969) showed that tree species, root system, and management practices determines survival and growth rate. In their studies, Sugar Maple, Pin Oak and Yellow Poplar were ranked from best transplanting to worst respectfully. Willow Oak was originally used but transplanted so poorly it was replaced with Pin Oak.

The purpose of this study was to expand knowledge of tree transplanting tolerances of various species of different sizes.

A total of 454 trees were received from nurseries in Tennessee and planted from November, 1975 to March, 1976 on the South Campus of Memphis State University. Ball sizes conformed to those recommended by the American Association of Nurserymen. The trees were planted in four replicated plots on 20 foot centers and pits were at least 15 inches larger than the balls. The pits were backfilled with a mixture of soil, peat and sand (3:1:1).

All trees were watered when set and watered thereafter as needed. The results reported here are based on records taken June 30, 1976.

In looking at the table it is noted that the Maples transplanted the best regardless of size, whereas the Willow Oaks transplanted the poorest regardless of size. Green Ash transplanted well but Bald Cypress did poorly.

The transplanting tolerances of the Sugar Maple and Willow Oak agrees with the results of the research work by Van de Werken (1965).

It is of further interest to note that the larger size of Willow and Pin Oaks transplanted better than the smaller trees. This may be the result of the larger trees having formed a more fibrous root system due to greater lateral root development. □

TABLE I

Transplanting Loss (Per Cent) of Seven Tree Species

SPECIES	SIZE (Caliber)	NUMBER OF TREES IN STUDY	PER CENT LOSS
Bald Cypress	2½-3"	29	24
Green Ash	1 -1¼"	48	2
Norway Maple	1 -1¼"	48	0
Red Maple	1½-2"	33	0
Sugar Maple	1 -1¼"	40	0
Sugar Maple	1½-2"	41	0
Pin Oak	1 -1¼"	23	9
Pin Oak	3 -3½"	86	0
Willow Oak	1 -1¼"	30	40
Willow Oak	3 -3½"	76	26

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Tank mixing pesticides for effective results

Tank mixing pesticides is a practice that has gained widespread acceptance in recent seasons. Time and labor savings are two of the obvious benefits, but certain precautions must be taken when using this practice to insure proper control. A recent survey conducted by Stauffer Chemical Company points up some general guidelines to get the most out of this system and limit possible mistakes.

Read all labels

First and foremost to remember before attempting any tank mix is to read the labels. The information contained may be long and involved, but it is there for a purpose: to help you make the best use of the material. Follow directions carefully regarding mixing, method of application, dosage, soil characteristics and other applicable information.

Recent EPA guidelines permit the use of non-registered tank mixes until Oct. 1977 if dosages do not exceed label instructions for any product in the mix used singly for the same pests on the same crops, and if labels do not explicitly instruct against such a mixture.

According to Dr. Douglas Murphy, agronomist with Stauffer Chemical Co., "before you mix any pesticides, first do a test for material compatibility. Many pesticides may not form a stable mixture causing layering or formation of precipitates. Application of a mixture of non-compatible materials will cause excessive rates of each chemical in separate parts of the field.

Test compatability

An easily performed compatibility test involves the following procedures:

First place one pint of the carrier, usually water or liquid fertilizer, in a quart jar. Then add each pesticide to be mixed, one at a time, and shake well between each addition. When adding the pesticides be sure to use the material in the same volume proportion as to be used in the field according to label recommended dosages and your soil conditions.

The usual order for pesticides to be added for proper mixing is: wettable powders first followed in order by flowables, water solubles, surfactants and emulsifiable concentrates. These are general recommendations and label information may give more specific directions.

After the materials are added and agitated thoroughly, let the jar stand for approximately one hour while inspecting for any separation by layer or precipitate formation. If there are any precipitates formed, or relatively quick separation into layers, the mixture is incompatible and should not be used.

Check agitation

"The amount of separation permitted depends somewhat on the agitation capabilities of the field spray tank. Generally, however, minor separating after 30 minutes is tolerable if field sprayer agitation is good," Dr. Murphy adds.

Compatibility tests should be performed each time you fill the spray tank even if using the same formulations. The same analysis of fertilizer may vary in mixing qualities from batch to batch and manufacturer to manufacturer, and untested mixes of the same material may cause problems.

Make sure you have good spray tank agitation. Even somewhat unstable mixtures may be possible if agitation is sufficient to keep them in suspension.

When mixing in the field sprayer, put the carrier in prior to addition of pesticides and allow time for thorough mixing between each material addition. Shortcuts may save you a few minutes, but the penalties can be exacted in yield and dollars.

Apply the fully agitated mixture as soon as possible after formulation to prevent possible separation, precipitation or caking. Do not allow mixtures to stand overnight without constant agitation.

Consult label information carefully regarding temperature and humidity data which may apply before mixing or if application is delayed.

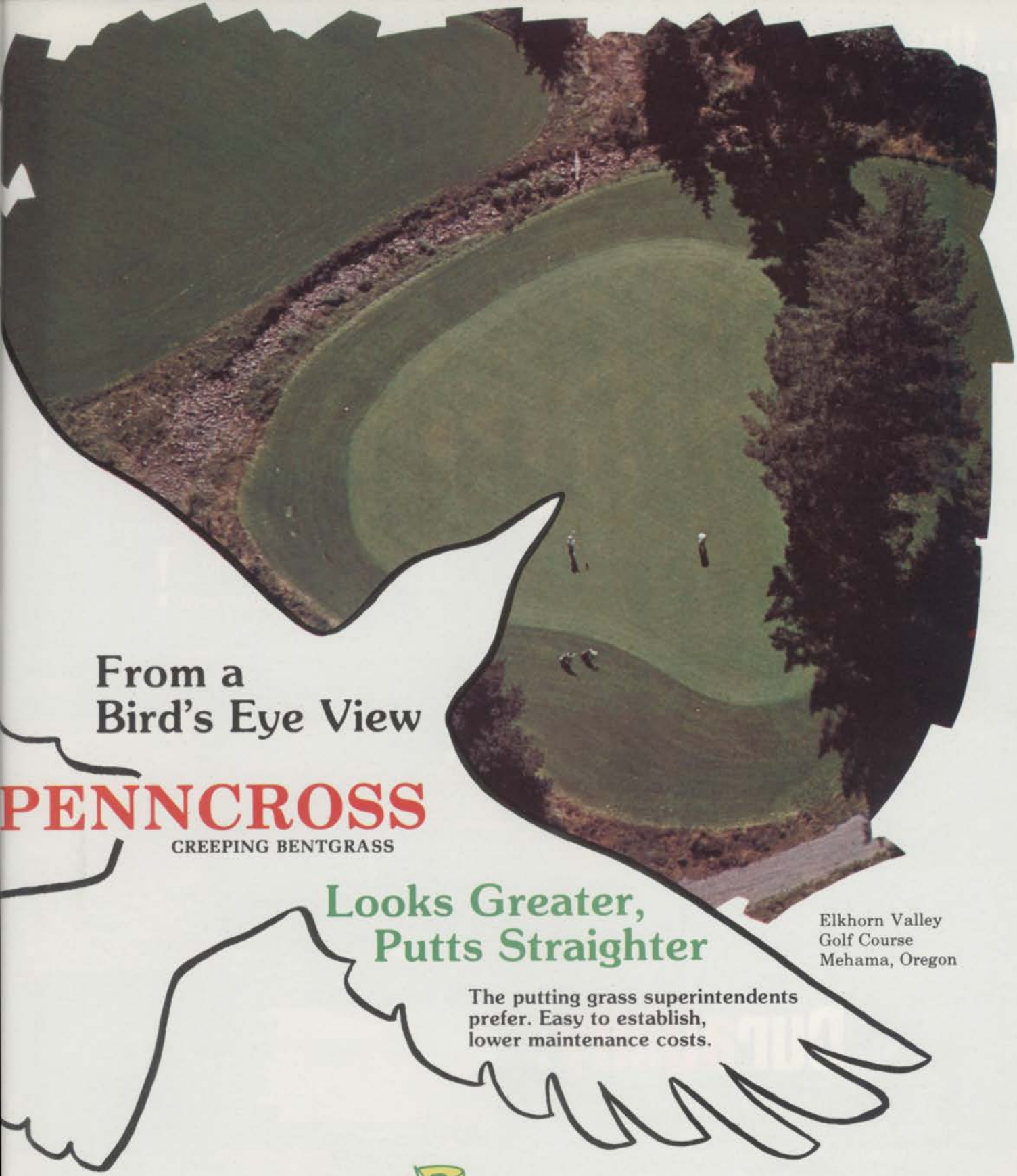
Test mix rates

If you are trying an unknown combination, test it out first on a small scale at varying rates and under different conditions before large scale use. Check with extension agents for information concerning university test data on new mixes or local water conditions which may affect mixtures.

Don't mix pesticides which require different application methods. "Using foliar insecticides like Imidan, for example, with soil incorporated herbicides like Sutan + or Eptam, will cause improper placement of one or both of the materials," Dr. Murphy explains.

Don't hesitate to seek help from your local chemicals dealer or manufacturers representative for advice if problems crop up. Many times they will have access to information you might not know exists.

Do not exceed or underrate dosages of registered tank mixes. Registration is granted only after exhaustive testing under all possible conditions to assure proper control. Varying these rates may result in crop injury or pesticide non-performance. □



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Lime applications for soil neutralization

By Dr. Roger C. Funk

Turfgrasses will not grow well in highly acid soils, and since many soils in the United States are acid by nature, well established lawns may require periodic applications of lime.

Acid conditions of soils can result from the leaching of calcium and magnesium (the alkaline constituents) from the root zone; yearly applications of nitrogenous fertilizers; the use of organic material as top dressing or as a soil conditioner; and the washing to sulphur from the air into the soil by rainfall.

Acid soils are commonly referred to as "sour," whereas alkaline soils are called "sweet." Soil reaction is measured by the concentration of hydrogen ions in the soil which is expressed by a unit (pH) between one and 14. A soil with a pH of seven is said to have a neutral reaction. Soils with a pH rating of less than seven are acid and those with a pH above seven are alkaline. The pH of most soils with an established turfgrass will vary between four and eight.

What is lime?

Lime is a compound of calcium or magnesium and is a term used quite loosely in the plant care industry. (Note: Calcium sulfate, [gypsum] is not a liming material.)

A chart of liming materials with their relative neutralizing values is given on the opposite page.

There are three major types of lime and each has its advantages and disadvantages.

(1) Ground agricultural limestone is also known as calcic limestone and is almost pure calcium carbonate ($CaCO_3$). Ninety-five percent of all lime used in the U.S. is calcium carbonate because it is the most abundant and cheapest form. Also, it is not caustic and disagreeable to handle as is burnt or hydrated lime.

Ground agricultural limestone containing significant amounts of magnesium carbonate is called dolomitic limestone or dolemite. Most recommendations for additions of lime are for ground limestone or its equivalent.

(2) Burnt lime is also known as quick lime or caustic lime and is primarily calcium oxide (CaO). Gloves should be worn when handling either burnt or hydrated lime. Burnt lime has twice the neutralizing effect of calcium carbonate and should be used at ½ the recommended rate.

(3) Hydrated or slaked lime is calcium hydroxide $(CaOH)_2$ and is about 1½ times more effective and quicker to react than ground limestone.

Effect of lime

Most cool-season turfgrasses respond best to a fertilization program when the soil pH is about 6.5. Soils with a pH significantly above or below 6.5 are not necessarily infertile, but nutrients may become unavailable by combining to form insoluble compounds which cannot be absorbed by grass roots. In addition, acid soils promote the solubility of heavy metals such as copper and zinc which may reach toxic levels and reduce plant growth.

Lime corrects an acid soil condition, thereby assuring maximum benefits from applied fertilizers and reduces the potential for heavy metal toxicity. Lime supplies calcium which is an essential macronutrient

Roger C. Funk Ph.D is director of research at the Davey Horticultural Institute.

For ad on preceding page circle 167 on free information card

Relative Neutralizing Values of Liming Materials

Liming Material	Chemical Formula	Relative Neutralizing Value, %
Magnesium oxide	MgO	250
Calcium oxide	CaO	178
Magnesium hydroxide	$Mg(OH)_2$	172
Calcium hydroxide	$Ca(OH)_2$	135
Magnesium carbonate	$MgCO_3$	119
Calcium carbonate	$CaCO_3$	100

for plant growth and development.

Calcium ions also help aggragate clay particles, improving air circulation and water drainage.

When and how to apply lime

Applications of lime on established lawns may be made at any time of the year. However, the most effective times are fall, winter and early spring — in that order. Alternate freezing and thawing and early spring showers help work the lime into the soil.

Lime must be spread evenly over the entire area because it does not move appreciably in a lateral direction. Lime should not be applied when the soil is too wet since it may be difficult to obtain an even distribution and the turf may be disrupted. If heavy equipment is required to spread the lime, less damage is done to the soil and grass when the ground is frozen.*

How much to apply

The amount of lime required to raise the soil pH to 6.5 will vary with the degree of acidity, the soil type and the lime material. Light, sandy soils require less lime than soils high in silt or clay, but will require more frequent applications. In general, a pH test every three to five years is recommended.

Single applications of over 50 pounds of lime per 1,000 sq. ft. are not recommended. If over 50 pounds are required, divide the total amount in increments of 50 pounds and allow at least six months between applications. Heavy applications of lime can be just as damaging as lime deficiency. □

**Most lime is applied through a drop spreader to ensure uniform, controlled distribution and to minimize dust. However, a recently developed pelletized, or granular, lime allows the use of a cyclone spreader. Care should be taken around acid-loving plants to confine lime to lawn areas.*

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Lawn and garden equipment market to triple by 1985

The market for lawn and garden equipment, at $3.6 billion in 1975, will climb to $9.8 billion by 1985, forecasts a new study by market research specialists Frost & Sullivan, Inc. in New York City. The market for lawn and garden growing products and supplies, at $1.8 billion in 1975, will reach $3.8 billion by 1985, it adds.

The 211-page study analyzes specific product categories to forecast market growth as follows:

HARDLINES SALES

Categories	Percent Increase 1975-85
Power Lawn Mowers	154%
Other Big Power Tools	164%
Hand Power Tools	249%
Non-Power Garden Tools & Equipment	181%

GROWING PRODUCTS AND SUPPLIES SALES

Categories	Percent Increase 1975-85
Fertilizers	88%
Pesticides	59%
Soil Conditioners	82%
Grass Seed	N/A
Growing Products	156%

Within hardlines, chain saws are the fastest growing item, the study finds, with the market made up of gas-powered models that sell for $150 and the faster-selling electric saws priced at $50 at retail. Unit sales on chain saws will double by 1980 and will more than triple by 1985, the study forecasts.

"The handpower tool market is also booming, and it will continue to do so," the study adds. Another high growth area: non-powered garden tools and equipment. As for plants and other growth products, their sales will climb steadily over the next ten years, the study says.

On the other hand, fertilizers, soil conditioners, and pesticides are becoming mature markets.

The study entitled "The U.S. Market for Lawn and Garden Equipment and Supplies" also reports on an important survey of retailers, wholesalers, and manufacturers; it identifies nine types of retail outlets. The more important include general merchandise stores that account for 26 percent of all lawn and garden sales; specialist outlets, including retail nurseries, that account for a 17 percent market share; and home centers and hardware stores that hold a 10 percent market share.

Florists hold a 35 percent market share, but cut flowers generate most of the revenues. In recent years, however, florists have moved heavily into potted plants and foliage, the study says, and thus this retail sector has become "an economic factor in the marketplace."

Here's how selected retail outlets will participate in the market growth:

- **Retail lawn and garden stores (including nurseries):** Their sales currently running at $1 billion annually will climb to $3.6 billion by 1985 to experience "the sharpest growth in lawn and garden merchandise sales." Lawn and garden stores have increased sales in recent years at a faster rate than have general merchandise stores, and this trend will also continue, the study concludes.
- **Hardware, lumber, and home center stores:** While lawn and garden product sales accounted for by hardware outlets have fallen significantly over the past 20 years, the sale of such merchandise through home centers has increased very rapidly in the last five to eight years. Furthermore, such sales growth by home centers that emphasize lawn and garden merchandise in the first place will continue to increase.
- **General merchandise stores:** These once accounted for the highest growth rate in lawn and garden supply sales, but now F&S forecasts "a somewhat lower rate of growth" in the future. However this type of store will continue to dominate the hardlines area. □

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Ureabor	High	Excellent	Excellent		Strong control of deep-rooted perennial weeds.
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How to make your board see the value of new turf equipment.

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All this dictates the use of specialized equipment that wasn't available ten or even five years ago. Equipment that will enable you to build and maintain a top flight course, and help avoid special turf problems that could prove extremely costly.

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Equipment life should be a prime consideration when you select a manufacturer. The longer a machine works, the more it does, and the less maintenance it requires, the better your investment. And here's where we'd like to put in a little plug for Cushman and Ryan turf equipment.

Both lines of machinery are built to last . . . and last. It's not unusual to see a piece of Cushman or Ryan equipment still doing it's daily chores after ten or fifteen years of use. We believe the idea of "planned obsolescence" should be obsolete.

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If "A Day With the Board" is in your future, we'd like the opportunity to tell you more about the full line of Cushman and Ryan Turf equipment. Write to us and we'll send you our catalogs, full of detailed product information. Information that may help you open a few eyes to the value of new turf equipment.

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Superintendents urged to use wastewater

PORTLAND, ORE., FEB. 10 — Golf course superintendents from around the country were urged here today to consider using sewage effluent for irrigation to help conserve water.

James W. Adams, group vice president for irrigation of The Toro Co., speaking at the annual conference and show of the Golf Course Superintendents Association of America, said use of effluent for golf course irrigation is already being practiced in the U.S. and will expand rapidly in the next few years.

By using effluent, Adams said, superintendents will reduce their water costs and gain some soil nutrients, in addition to helping to conserve water. Use of effluent for irrigation also could help reduce the cost of sewage treatment and disposal for local governments, he added.

Adams said his company has identified about 50 golf courses in the U.S. that are using treated wastewater for irrigation.

There are more than 30 in California; at least a half-dozen in both Arizona and Colorado, and one or more in Texas, Florida, Illinois, Idaho, Missouri, New Mexico, Nevada, New Jersey and Pennsylvania and probably several other states, he said.

Some golf courses now operating could not continue without wastewater, he declared.

Adams said the amount of wastewater available for irrigation is going to expand dramatically in the next few years, mainly as a result of action by the Environmental Protection Agency. The EPA now requires municipalities applying for grants for sewage treatment facilities to prove the proposed facilities meet the best possible cost-effective criteria. This, he predicted, will encourage on-land disposal.

Additionally, he said, other pollution control authorities — state and county — are making it very difficult, if not impossible, to discharge treated wastewater into receiving waters.

Adams said the military has been in the vanguard of users of wastewater for golf course irrigation. Fitzsimmons Army Hospital in Denver probably was the first, starting in 1940.

Golf courses at Fort Huachuca in Arizona, and March Air Force Base in California also have been irrigated with wastewater since the early 1940's.

Other military facilities whose treated sewage is used for irrigating their golf courses are: Marine Corps facilities at Camp Pendleton, El Toro, and Twenty nine Palms, CA; the Air Force Academy and Fort Carson, in Colorado; George Air Force Base, CA; Reese Air Force Base, TX; China Lake Naval Weapons Center, CA; and Scott Air Force Base, in Illinois. □

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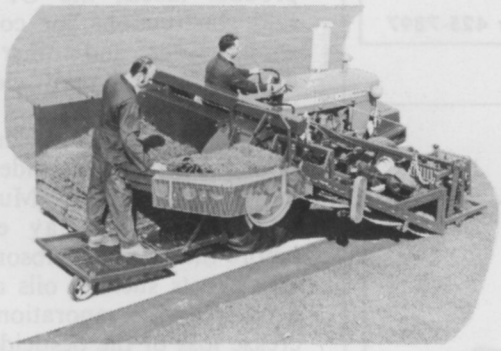

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Brief labels for pesticides not practical

Like many other users of pesticides, you may wonder why the instructions for using a herbicide or insecticide are so long and complicated. If you want a product label that will tell the whole story in 25 words or less, a University of Idaho expert can give you 100 good reasons why this hoped-for brevity would not be to your advantage.

"Pesticides can be used effectively only when the applicator understands the characteristics of the product he is using — and that's the information you get on the product label," Glen A. Murray, professor of plant and soil sciences, said at the UI Plant Protection Seminar.

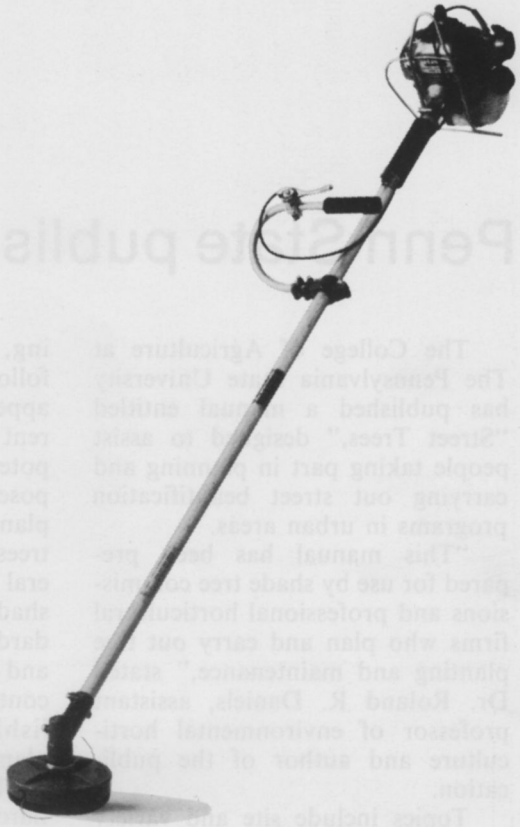
Users of agricultural chemicals cannot expect good results if they ignore the warnings included on the product labels, the UI professor said. Instructions for coping with wind, water and other environmental factors merit close attention, he said.

"Under hot, dry, windy conditions, spraying a pesticide on plants may do little good," Murray said. "The pesticide may evaporate before the plant can absorb it. Wetting agents such as oils and detergents reduce evaporation and decrease loss of the pesticide."

Soil-applied pesticides may encounter many barriers that prevent contact with plant roots and underground shoots, he added.

"The pesticides may be lost through leaching or soil erosion. Light, chemicals or soil microorganisms may break down the pesticides, making them ineffective," he said.

As a guide to effective use of pesticides, Murray offered this short, clearly worded slogan: "Read the label and follow the instructions to the letter." □



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Remember that The Green Machine is gas powered. There are no cumbersome electrical cords to worry about. The powerful, lightweight 22.5 cc engine gives you torque to do the full range of jobs without the stalling-out problem often found with electrical units.

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Penn State publishes "Street Trees" manual

The College of Agriculture at The Pennsylvania State University has published a manual entitled "Street Trees," designed to assist people taking part in planning and carrying out street beautification programs in urban areas.

"This manual has been prepared for use by shade tree commissions and professional horticultural firms who plan and carry out tree planting and maintenance," stated Dr. Roland R. Daniels, assistant professor of environmental horticulture and author of the publication.

Topics include site and variety selection, site preparation, planting, and care and maintenance following planting. Included in an appendix are:(1) a checklist of current street plantings and analysis of potential planting sites; (2) proposed specifications for selecting, planting, and maintenance of street trees within developments; (3) general specifications for deciduous shade and flowering trees; (4) standards of workmanship for tree care and maintenance; and (5) suggested contract specifications for establishing and maintaining street plantings.

Two other features are a tree hardiness zone map of Pennsylvania and an outline of characteristics for trees suitable for planting in the Commonwealth.

The manual may be purchased for $2.12, tax included, from STREET TREES, Box 6000, University Park, PA 16802. Make checks or money orders payable to The Pennsylvania State University.

Typical of comments regarding the manual is this statement from a teacher in Canada: "Your publication is a significant contribution to the popular literature describing aesthetic horticulture and urban forestry tree selection and maintenance. It should have wide application throughout northeastern North America." □

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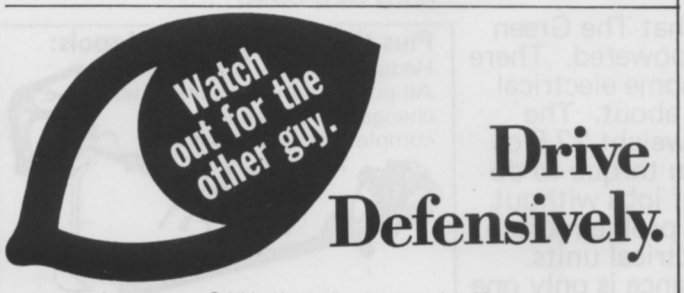

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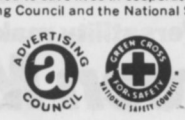

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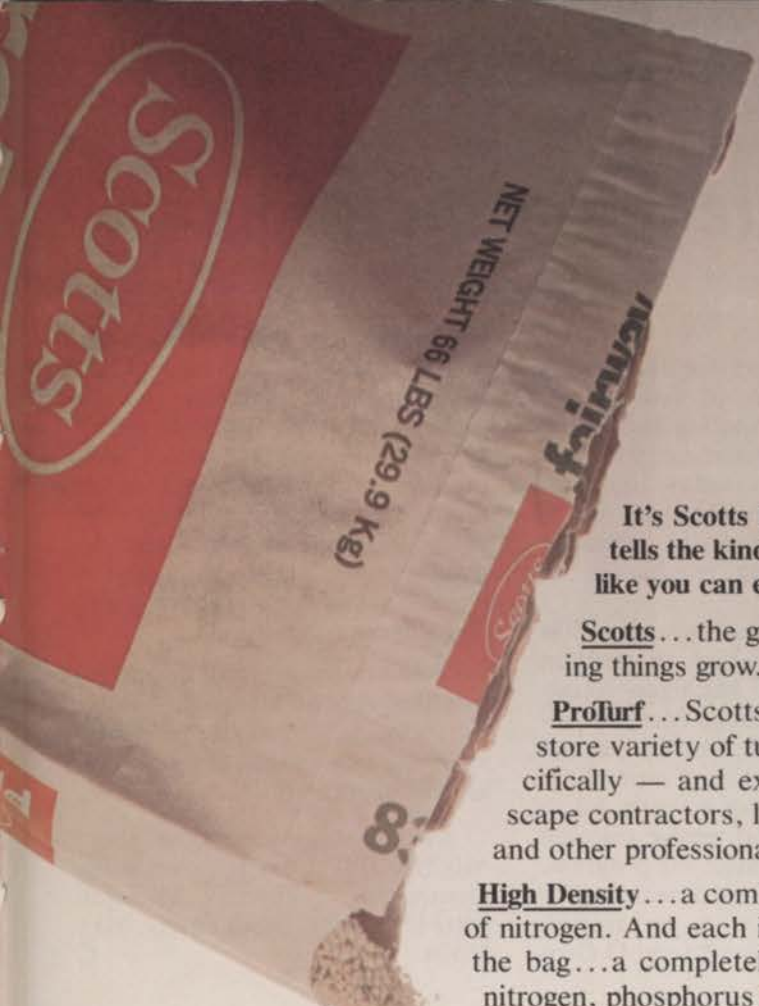

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MSU gets $30,000 grant for tree program

The Michigan Department of Natural Resources (DNR) has given Michigan State University researchers a $30,000 grant for tree and forestland improvement throughout the state.

The annual renewable grant will aid MSU and the Michigan State Cooperative Tree Improvement Program (MICHCOTIP) in increasing forest productivity.

Dr. James Hanover, MSU forestry specialist and program coordinator, and researchers are trying to accomplish this through cultural and genetic improvements.

Part of the effort involves developing superior hybrids which mature more quickly than ordinary trees. To date, MSU has developed special varieties of fast growing spruce, poplar, aspen and birch. Seeds from their varieties are being used to start plantations throughout Michigan.

The researchers are also testing cultural practices of fertilization, herbicide trials, spacing techniques and nursery production of hybrid varieties. These studies are conducted on cooperators' lands throughout Michigan to determine optimum growing conditions for certain species.

MICHOTIP was formed in 1974 as a cooperative effort to work on the problems of Michigan forestlands and urban trees. Members include MSU, DNR, universities and private companies from around the state. Members pay a yearly fee to participate in, and receive research benefits done through the program.

Part of the total research program is MSU's work on accelerated-optimal-growth *Accel-O-Gro) for rapid tree production. In Accel-O-Gro, trees are grown under greenhouse conditions, and through use of light and temperature controls growth is continuous and not affected by seasonal fluctuation. Trees can then be grown to the desired size much faster than regular nursery practices. Researchers can also determine more quickly the superiority of weaknesses of species grown under these conditions.

These techniques will be applied to all aspects of Michigan forestry — including street tree improvement and commercial and state forestland operation.

For more information about MICHCOTIP from Hanover write: Department of Forestry, Michigan State University, East Lansing, MI 48824. □

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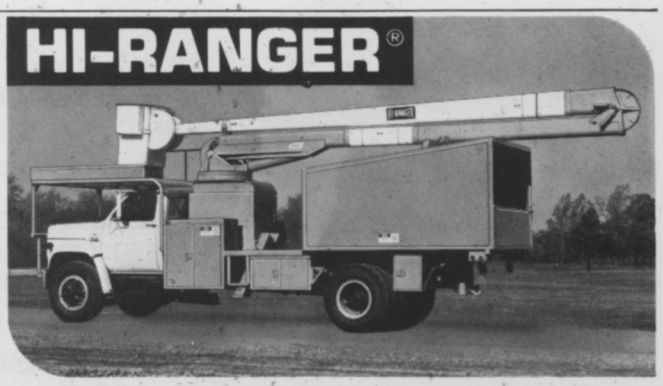

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Pest Control

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Imminent patent expirations to impact $1.6 billion pesticide market in Europe

About 115 British pesticide patents will expire during this year and the next, "and the expirations will open up new manufacturing possibilities," finds a study on the European market for insecticides, fungicides, herbicides, and other pesticides by market research specialists Frost & Sullivan, Inc. in New York City. Such patents include one held by BASF on a urea derivative herbicide, by Monsanto on a Quinazolines fungicide, by Bayer on a carbamic ester insecticide, by Geistelich Sohne on a thiourea derivative biocide, and by Lyonnaise Ind Pharmaceuticals on an Indandione derivative rodenticide.

This is but one finding in an unprecedented probe into the European pesticide market that, in 1975, amounted to $1.6 billion. Herbicides account for half of that figure, fungicides for about a quarter, and insecticides and miscellaneous pesticides for something less than 25 percent. By country, the largest national market is France at $602 million a year, followed by West Germany at $296 million, Italy at $179 million, United Kingdom at $165 million, and Spain at $117 million.

Altogether the European Economic Community, that makes up the geographical market scope covered by the 212-page study, compares to the United States in agricultural self-sufficiency, especially in meats, dairy products, sugar, and cereals (except for maize). In addition, the EEC accounts for nearly half the world's wine production. "Europe makes up a very large pesticide market," says the study, which also includes a chapter on the Russian market.

To meet that market need, some 1,000 companies turn out at least ten times that many pesticide formulations. By end-user category, forestry pesticides, in particular, offer "a scope for considerable expansion," while animal husbandry pesticides may decline in relative importance over the long term, the study says.

As for pest control, the industrial market is worth approximately $50 million annually, with termite protection and other wood preservation measures accounting for half of the expenditures. An additional

Continued on page 40

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expirations affect european market

Continued from page 39

$100 million market for pesticides in home and garden applications is growing at a 4 percent to 5 percent annual clip. This market is characterized by high-priced, high-margin products.

Government regulations present the biggest uncertainty to pesticide producers. "Regulatory schemes among the various countries are fundamentally similar, but maddeningly different in detail," the study says. A typical control requires a pesticide producer to show evidence that a new product is toxicologically and environmentally safe. Some countries also require a producer to prove the efficacy of a product. But virtually all countries either restrict or forbid the use of organo-chlorine insecticides and arsenites, and they limit organic mercurial applications to seed dressings.

The hodgepodge of government controls has hurt new product development. Of the $20 million that it costs to come up with a new pesticide, a manufacturer tends to spend about $10 million on data gathering just to win government approval.

The EEC will eventually come to regulate pesticide use, so that a universal control scheme can prevail throughout Europe, the study forecasts. Such a scheme is likely to combine the wide scope of British regulations along with the provision in French, Belgium, and Norwegian schemes that require pesticides to be re-approved periodically. "The resulting control could be superior to any one of the separate national schemes," the study observes.

Despite the government obstacles, some product innovation does go on. Synthetic pyrethrin-type insecticides will become commercially important within a few years, the study project. Another R&D trend is to develop herbicides that apply to a single crop. Also, more and more companies are turning out synergistic mixtures of traditional pesticide formulations. Looking further down the road, compounds that translocate downwards in a plant to do a job against soil-borne disease and pests will become "of great importance" in pesticide development. □

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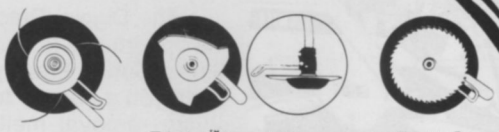

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$500 research grants offered

The Horticultural Research Institute has announced the availability of $500 Richard P. White Research grants for 1977. Any organization conducting research which may be of benefit to the nursery industry, including state and federal research laboratories, land grant universities, forest research stations, botanical gardens and arboreta, is invited to make application for one of the grants.

Recipients are selected on the basis of information provided on a simple questionnaire. Grant funds must be used for the purchase of supplies and materials for starting a project or enabling its completion. HRI would receive reports on progress and/or results of the work which would then be communicated to the nursery industry. Applications must be submitted by May 1.

Grants will be announced at HRI's New Horizons research forum at the Annual Convention of the American Association of Nurserymen, July 16-20, Seattle, WA.

The grants are named after Dr. Richard P. White, instrumental in the founding of the Horticultural Research Institute, a non-profit institute devoted exclusively to the support and conduct of research necessary for the advancement of the nursery industry.

Grant applications are available by writing HRI at 230 Southern Building, Washington, D.C. 20005.

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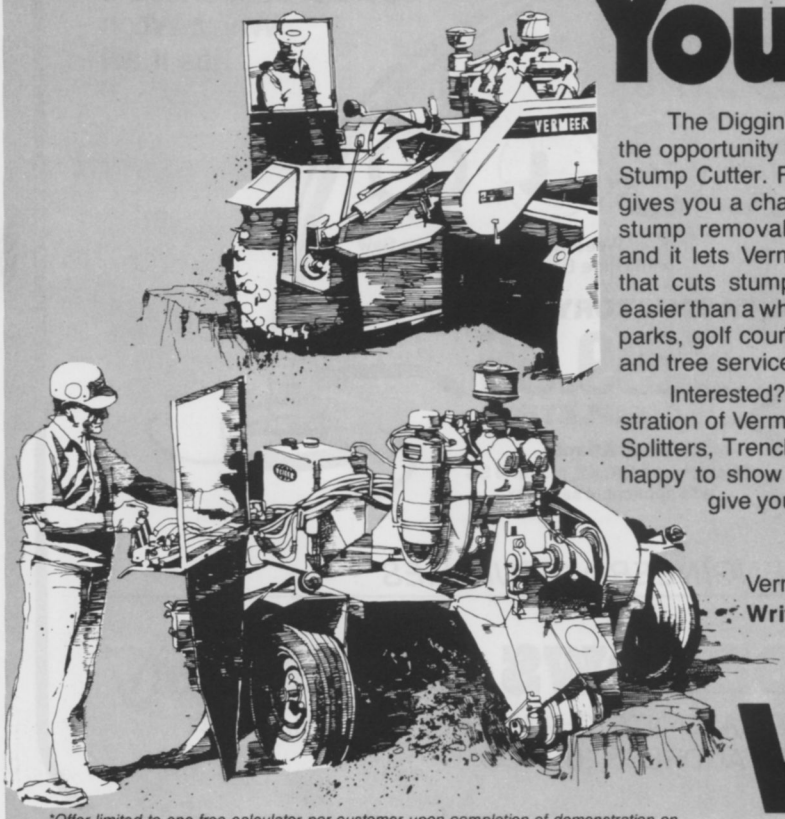

The Diggin' Dutchman is giving away a **free calculator***... just for the opportunity to demonstrate his economical, one-man Vermeer Stump Cutter. Frankly, it's a good deal for both of us. It gives you a chance to compare the Vermeer with costlier stump removal methods under similar conditions... and it lets Vermeer demonstrate its patented machine that cuts stumps into chips in minutes... faster and easier than a whole crew. A proven workhorse for cities, parks, golf courses, landscapers, contractors, utilities and tree service firms everywhere.

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Find out why more stumps are removed with Vermeer machines than all other units combined.

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Vermeer

THE DIGGIN' DUTCHMAN

*Offer limited to one free calculator per customer upon completion of demonstration on customer property or job site. Offer expires at discretion of Vermeer Manufacturing Company.

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baseball, golf, football . . .

FOR MICKEY MANTLE AND WHITEY FORD, THE "NAME OF THE GAME" IN GRASS IS

Adelphi
KENTUCKY BLUEGRASS

(U.S. Plant Patent No. 3150)

RATED OUTSTANDING FOR OVERALL PERFORMANCE

- IN YEARS OF TESTING AT LEADING UNIVERSITIES.
- IN ACTUAL USE BY PEOPLE WHO KNOW GREAT GRASS, GROW GREAT GRASS and DEMAND GREAT GRASS.

Mickey Mantle and Whitey Ford know plenty about grass. For them, it's "ADELPHI" . . . with darker green color the entire growing season, excellent density, good disease resistance, tolrance to moderately close mowing.

Photography at McGOVERN SOD FARMS, Melville, N.Y.

Now, more than ever... IF YOUR "GAME" IS GRASS...THE NAME IS "ADELPHI"

"ADELPHI" HAS BEEN CHOSEN by the Plant Variety Protection Office, U.S.D.A., AS A STANDARD FOR DARK GREEN COLOR to which all bluegrasses applying for plant protection will be compared for color classification.

(Use of this statement does not indicate any approval or recommendation of Adelphi by the U.S.D.A.)

FOR INFORMATION, CONTACT:

J & L ADIKES, Inc.
Jamaica, N.Y. 11423

JONATHAN GREEN & SONS
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Canadian Inquiries: **National-NK Seeds Ltd.**, Box 485, Kitchener, Ont. • **Rothwell Seeds Ltd.**, Box 511, Lindsay, Ont.
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"Without Laval Separators, we couldn't have opened for the winter season." *-Arthur R. Weaver, P. E.*
Perini Land & Development Company
West Palm Beach, Florida

"We were nearly finished with the North Course at the President Country Club. It was critical that we grass immediately to insure play by the coming winter season.

"But we had trouble with sand in our wells. So much sand was entering the electric solenoid control valve that our irrigation system wouldn't function.

"We called on the Laval Separator distributor in our area. They installed two six-inch 600 gpm industrial separators.

"The separators did their job. In fact they did so well, we even bought two more for our South Course. And we've had no further sand problems."

Laval Separators, from 3-4100 gpm, will remove up to 98% of all particles as small as 200 mesh (74 microns). If you've got a problem with sand, call on Laval.

For more information write: Laval Separator Corp., 1911 N. Helm, P.O. Box 6119, Fresno, California 93703

Dept. DD1

LAVAL SEPARATOR CORP.

Circle 143 on free information card

Chemical firms may save 15% of energy used

The chemical industry will save enough energy to heat 10 million homes a year in 1980 alone, according to a business executive.

John R. Ryan, Hercules Inc. vice president, said the energy savings will be achieved in three years as a result of massive energy conservation projects now under way or planned by U.S. chemical firms. These savings will be the energy equivalent of 125 million barrels of oil each year.

Speaking at an energy-conservation luncheon, the Hercules spokesman noted the chemical industry "will achieve a 15 percent saving in energy use within three years."

Ryan spoke after government leaders and news media representatives toured recently completed energy saving projects at a Plaquemine, La., methanol plant. The projects totaled more than a million dollars and are currently resulting in substantial energy savings.

The former Hercules plant is now owned by Hercofina, a joint venture between Hercules and American Petrofina, Inc.

The vice president said Hercules' cumulative energy savings at 50 major plants would approach $75 million over the next four years. He said several Hercules plants have already cut energy use by more than 20 percent.

"Soaring energy costs make conservation measures essential for industry," said the vice president. "It's also good business. Our projects show investment returns of at least 20 percent. Some have even resulted in more than 100 percent return." □

DON'T FALL FOR REAR-WHEEL STEERING.

What happens if that rear wheel leaves the ground on a downhill run? Nothing, if your mower's a HUSTLER.

The HUSTLER 272A steers with its drive wheels. Dual hydrostatic transmissions direct power to each wheel. Dual hand levers control those wheels, weight centered over them for traction and stability. Downhill, as the weight shifts forward, traction actually improves! You keep control. On rear-steer mowers, you lose it.

Downhill, sidehill, or on the level, HUSTLER drive-wheel steering excels.

We can prove it. We'll put the HUSTLER 272A through its paces on the level, where no mower on the market can outmaneuver it. And we've seen HUSTLER run up and down hillsides with its operator relaxed and confident, steering, accelerating, and braking with one hand!

Others have copied many HUSTLER features we pioneered, but not our most important maneuverability concept — drive-wheel steering. HUSTLER mows clean, no leftovers, no wasted action. The more trimming, the more time and money you save with a HUSTLER 272A or 272A Standard. Favored by service crews, groundskeepers, and cost accountants for its low maintenance and payroll savings on the job.

Watch for an area field demonstration, or let us know you want to see it out-hustle the rest. Call toll-free: **(800) 835-3260.** Or drop your business card in the mail for literature and Distributor's name.

Approved for Government Purchase: GSA# GS-07S-00759 HUD# OHP(CO) M-1821

HUSTLER Turf Equipment

Excel Industries, Inc.
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In Kansas and Canada call collect (316) 327-4911

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For ad on following page circle 120 on free information card

Q. How can you make Underground Installations without damaging Expensive Turf?

A. Ditch Witch vibratory plow equipment can make underground installations in many situations without it being necessary to dig trench. Underground sprinkler systems, electrical lines for outdoor lighting and other types of service lines all may be installed quickly and efficiently with a vibratory plow. Since no ditch is dug, there's only minimal turf damage. Let your Ditch Witch dealer show you the right plow for your needs. He offers the most complete line of vibratory plows available. Charles Machine Works, Inc., P.O. Box 66, Perry, Oklahoma 73077. TWX 910-830-6580. For the name of your nearest dealer Call Toll Free (800) 654-6481.

VP12 service plow.

DITCH WITCH

DITCH WITCH™ HAS THE ANSWER!

18 DELICATE GREENS THAT NEED SPRAYING... FAST.

USE YOUR CUSHMAN.

If you own a Turf-Truckster, you already have the power for a power sprayer.

An 18-hp Turf-Truckster with PTO, extension shaft, and compact spraying rig lets you spray delicate greens quickly and gently. But you can also spray hard-to-reach rough, trees, bushes, foliage, fairways, or just about any area.

The 100-gallon polyethylene tank and spraying equipment mounts in either the short or flatbed/box in minutes. Hook the centrifugal pumping system to the PTO, select either the fold-down boom, boomless nozzle, or high-pressure handgun, and you're ready to spray.

There's no need for pressure regulators or other high maintenance parts. The Turf-Truckster transmission teamed with the variable-speed governor assures uniform ground speed over varying terrain. And the accuracy of the metered spray can reduce chemical waste.

The end result is an all-purpose spraying rig that can handle just about any spraying job you have . . . and handle it for years to come. Because, like every Cushman product, it's built for longevity as well as performance.

With other accessories, your Cushman can spike, dump, aerate, and top dress. Use it. It's a lot more than basic transportation. It's a total turf-care system.

Write for your Cushman Turf catalog today.

CUSHMAN
TURF-CARE
EQUIPMENT

OMC-Lincoln, a Division of
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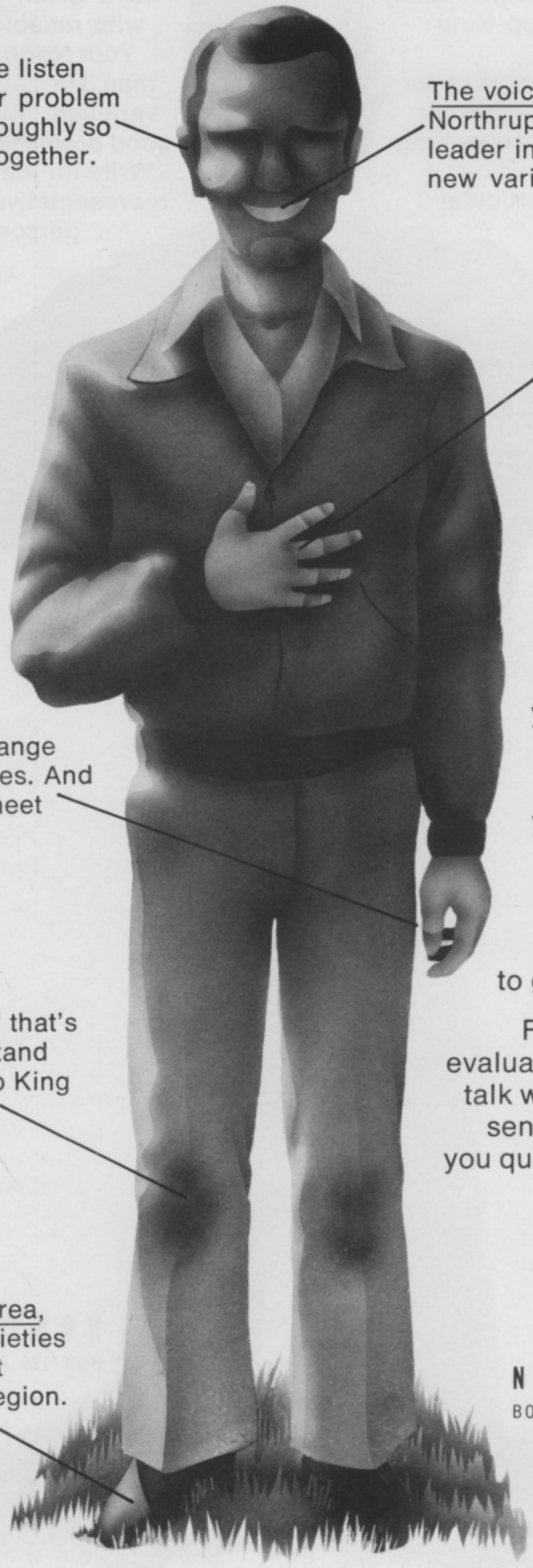
2224 Cushman Drive, P.O. Box 82409,
Lincoln, NB 68501

 Circle 148 on free information card

What does your Northrup King man offer you besides quality turfseed?



A willing ear. We listen carefully to your problem and study it thoroughly so we can solve it together.

The voice of experience. Northrup King continues to be a leader in the development of new varieties and blends.

Reliability. Northrup King has a testing and quality control program that is your assurance of quality seed.

At his fingertips, a wide range of proven turfseed varieties. And we can custom blend to meet your special needs.

Grass-stained knees, if that's what it takes to understand your problem. Northrup King people get involved.

Feet firmly planted in your area, so we can recommend varieties and formulate mixtures that will work in your particular region.

The right turfgrass decision can improve the quality of your turf. It can also save you maintenance dollars.

So the person who helps you make that decision is very important to you. That's why we stress the professionalism of your Northrup King man. And his willingness to get involved with your needs.

For a thoroughly professional evaluation of your turf requirements, talk with your Northrup King representative or distributor. He offers you quality turfseed—and a lot more.

NK®

NORTHRUP, KING & CO.
BOX 959 • MINNEAPOLIS, MINNESOTA 55440

Your Northrup King man is also your Adelphi man.

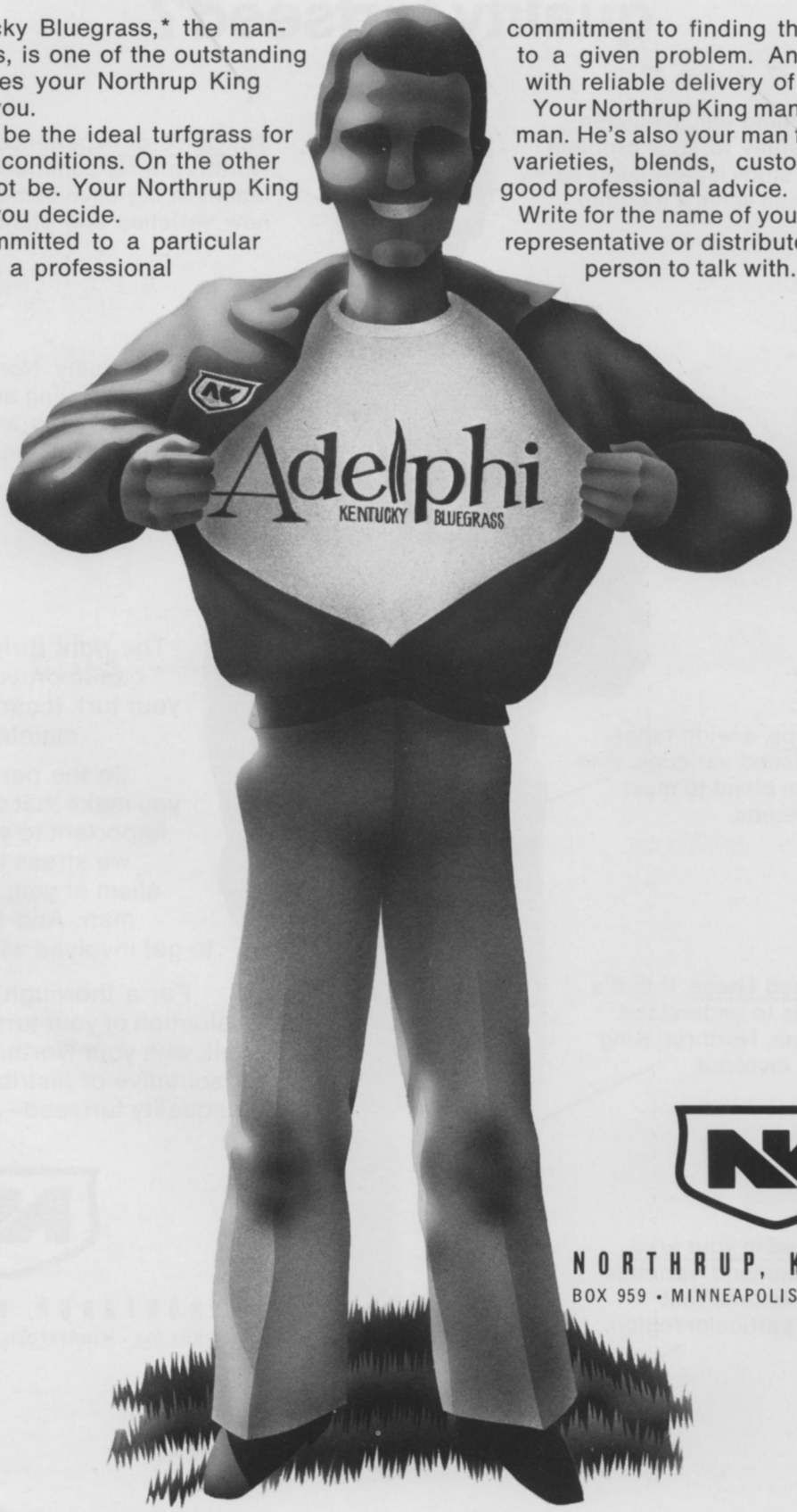
Adelphi Kentucky Bluegrass,* the man-made bluegrass, is one of the outstanding turfseed varieties your Northrup King man can offer you.

Adelphi may be the ideal turfgrass for your particular conditions. On the other hand, it may not be. Your Northrup King man can help you decide.

He's not committed to a particular variety. He has a professional commitment to finding the best solution to a given problem. And following up with reliable delivery of quality seed.

Your Northrup King man is your Adelphi man. He's also your man for a lot of other varieties, blends, custom blends and good professional advice.

Write for the name of your Northrup King representative or distributor. He's a super person to talk with.



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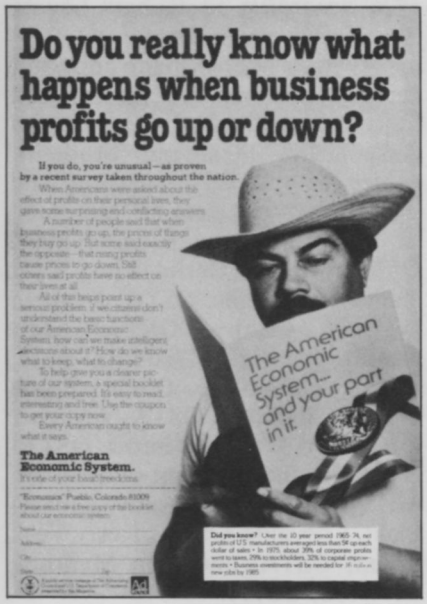
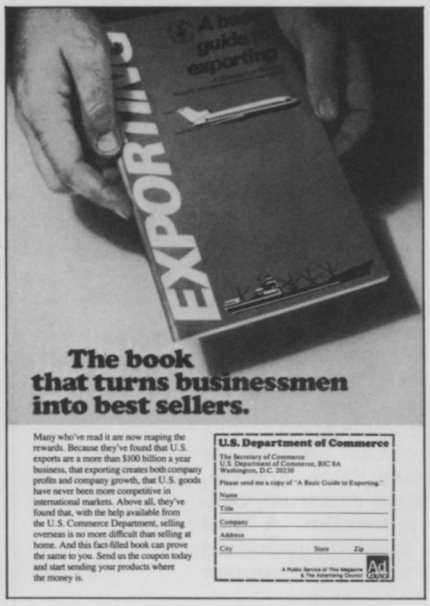
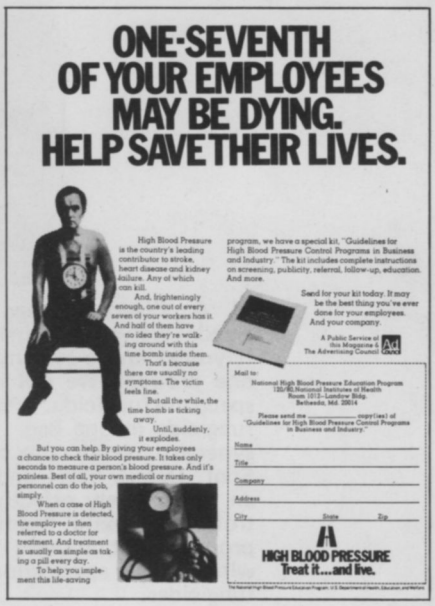
*P.P. 3150

WHY YOU SHOULD MAKE A CORPORATE CONTRIBUTION TO THE AD COUNCIL







The Advertising Council is the biggest advertiser in the world. Last year, with the cooperation of all media, the Council placed almost six hundred million dollars of public service advertising. Yet its total operating expense budget was only $914,683, which makes its advertising programs one of America's greatest bargains . . . for every $1 cash outlay the Council is generating over $600 of advertising.

U.S. business and associated groups contributed the dollars the Ad Council needs to create and manage this remarkable program. Advertisers, advertising agencies, and the media contributed the space and time.

The Advertising Council is a voluntary organization that promotes the public good by conducting information and action campaigns in such areas as support for higher education, drug abuse prevention, rehabilitation of the handicapped, traffic safety and many others. Recently, it added an exciting new campaign to its list: one to encourage Americans to learn more about our economic system.

Yet this donated creative effort, time, and space are not enough to do the job. Money is necessary to operate: Money to service thousands of mass media outlets with the materials needed to publish or broadcast the advertising message.

Your company can play a role. If you believe in supporting public service efforts to help meet the challenges which face our nation today, then your company can do as many hundreds of others—large and small—have done. You can make a tax-deductible contribution to the Advertising Council.

At the very least you can, quite easily, find out more about how the Council works and what it does. Simply clip and mail the coupon below. You'll receive material which tells how American management is helping to solve many of today's problems.

Mail to: Robert P. Keim, President
The Advertising Council, Inc.
825 Third Avenue, New York, New York 10022

Ad Council

☐ Please send us your material

Name_____

Company_____

Address_____

City/State/Zip_____

The cost of preparation of this advertisement was paid for by the American Business Press, the association of specialized business publications. The space was donated by this magazine.

Golf Superintendents told us what they wanted. W.A. Cleary listened.

Spectro
Turf Fungicide

W. A. Cleary listened to your needs. . .and acted. We've combined a contact fungicide (Dyrene) and a systemic fungicide (3336) into one product. We call it SPECTRO, the broad spectrum fungicide. It's a contact and a systemic fungicide in one bag. . .one application. . .one synergistic product to control Leaf Spot, Dollar Spot, Copper Spot and Brown Patch. Spectro, an immediately effective broad spectrum, controls with extra residual protection. A dual product that answers the problem associated with a single application of systemic or contact fungicides.

And in most areas the same "dual" control is available in another W. A. Cleary product. . .BROMOSAN (3336 and Thiram). When things seem to get out of hand, rely on Bromosan. One product takes the place of two applications.

W-A-CLEARY CHEMICAL CORPORATION
1049 Somerset St., Somerset, NJ 08873
(201) 247-8000

Circle 133 on free information card

Oregon Seed Assoc. gives scholarships

The Oregon Seed Trade Association presented cash scholarships totalling $4,200 to Oregon State University students in December 1976 according to Robert Lowry, Association president.

Awards were made possible through the use of Association funds and individual donations by Association members. Students' names with their hometowns and the scholarships were as follows:

Richard Lawson, Klamath Falls, OSTA-Gordon Burlingham; Dick Yancey, Prineville, OSTA; Kenneth Iverson, Canby, OSTA-Continental Brokers; Drucilla Bass, Salem, OSTA-Lee Olsen; Ralph Fisher, Silverton, OSTA-Normarc, Inc.; Merri Woodell, Burns, OSTA-Normarc, Inc.; Vincent Obersinner, Mt. Angel, OSTA; Andy Vander-Plaat, Corvallis, OSTA; Kerry Veal, Salem, OSTA; and Ron Myhrum, Silverton, OSTA.

Interviews were conducted by Dr. Jerry Pepin, Jim Smith, Alan Hick, Gerry Engle, and Russell Stark, members of the OSTA Scholarship Committee.

Stark says that academic standing is one of the criteria used in selection of recipients, but other factors, such as past experience, future plans, need, character, and personality are all considered. □

WILT PRUF
ANTI-DESICCANT

Protects against plant damage due to

WINTER KILL • TRANSPLANT SHOCK
WIND BURN • AIR POLLUTION

An organic spray that substantially reduces evaporation, the most frequent cause of plant damage. Safe to use on all plantings, trees and shrubs, both indoor and outdoor, deciduous and evergreen.

For technical information write to DEPT. W
NURSERY SPECIALTY PRODUCTS
P.O. Box 4280, Greenwich, Connecticut 06830

Circle 144 on free information card

SIX STROKE-SAVERS FROM DOLGE

1 **TOTE** non-poisonous weed killer for use where no growth whatsoever is wanted. Kills annuals, biennials, perennials on parking lots, drives, walks, gutters, courts. Finishes roots, stops seeds, sterilizes soil. 40 gallons of Tote in 60 or more of water cover a whole acre

2 **E.W.T.** selective weed-killer finishes broad-leaved weeds—kills dandelions, plantain, mouse-eared chickweed, even poison ivy—does not harm good grasses. Amine formulation: non-volatile; does not "jump" to flower beds or shrubbery.

3 **PENETRATE** natural, organic soil improver. Works through compacted soil; lets air, water and nutrients go deeper. Promotes deeper, stronger root growth. Encourages vigorous, beautiful turf, shrubs, trees. Prevents soil erosion and puddling of surface water. Speeds germination of wanted vegetation.

4 **LAKE DYE** a safe, non-toxic blue water dye for lakes, ponds, water hazards. Colors to shade of blue you desire. Apply 2 pounds to the acre, 4 to 5 feet deep. Harmless to wild life—swans, ducks, geese, fish, frogs. Harmless to grass too. Compatible with fungicides, insecticides, turf chemicals.

5 **DOLGE ANTI-DESSICANT** protects turf grasses and broad leafed evergreens against drought and snow. Allows plants to breathe, yet prevents loss through water transpiration. Guards against summer scald and plant shock, too.

6 **BOOST** detergent-degreaser for machinery. Spray or mop it on mowers, tractors, carts; hose off: clean! In the clubhouse, Boost is a real handyman for extra-heavy cleaning jobs. Great on concrete floors.

Call collect today for a pre-season anti-inflation discount.

DEPENDABLE
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WHERE CLEANUP IS A SCIENCE

The C.B. Dolge Company Westport, Conn. 06880 • (203) 227-9591

Southern Subsidiary GOLTRA, INC., Drawer "D," Salem Station, Winston-Salem, N.C. 27108 (919) 724-7419

CLEANERS/FLOOR FINISHES/WAX STRIPPERS/POLISHES/DISINFECTANTS/DEODORANTS/PESTICIDES/HAND SOAPS/DISPENSERS/INDUSTRIAL DEGREASERS/WEED KILLERS/MACHINERY

Circle 136 on free information card

Meeting Dates

ALCA Student Field Day, Mississippi State University Campus, Starkville, MS, March 18-19.

Corrugated Plastic Tubing Association Annual Meeting, Innisbrook, Tarpon Springs, FL, March 20-23.

Institutional Garden Design Show, Pacific Design Center, Los Angeles, CA, March 25-28.

West Virginia Weed Control Association Annual Meeting, Holiday Inn No. 2, Charleston, W.VA, March 29-30.

31st Annual Southeastern Turfgrass Conference, Rural Development Center, Tifton, GA, April 11-12.

Southern California Turf and Landscape Institute, Anaheim Convention Center, Anaheim, CA, April 20-21.

1977 Arizona Turfgrass Conference, Sunburst Hotel, Scottsdale, AZ, May 4.

International Society of Arboriculture Conference, Hilton Inn, San Diego, CA, May 20-23.

California Association of Nurserymen Annual Refresher Course, Cal Poly, San Luis Obispo, CA, June 1-3.

Oregon Seed Trade Association Annual Convention, Sunriver Lodge, Sun River, OR, June 10-12.

National Turf Management Clinic and Trade Show, O'Hare Inn, Chicago IL, July 25-26.

Home Horticulture Lawn Garden & Patio Exhibit, Expo Center, Chicago, IL, Oct. 14-17.

Highlight

CHEWINGS-TYPE RED FESCUE

WORLD CHAMPION IN SUN OR SHADE

Judged World Champion at the 45th Annual Royal Agricultural Fair in Toronto, Canada, Highlight produces brilliant green turf and colonizes even in the dry root zone around trees.

A strong performer in winter and summer, Highlight may be cut to ¼ inch for specialized turf purposes. Blends beautifully with other grasses, shows excellent seedling vigor, requires less fertilizer and water and is unusually disease-resistant.

For further information and free brochures write:

INTERNATIONAL SEEDS, INC.

Dept. D • P.O. Box 168 • Halsey, Oregon 97348

Telephone: A/C 503 369-2251

Circle 160 on free information card

The Billy Goat suction sweeper is the economical and versatile way to put litter in its place – it's a machine for all reasons.

Whether the job is to eliminate turf litter or industrial debris, the Big Wheel gets the job done quickly and thoroughly. Built for rugged use, the BT-70 works as easily on turf as it does on pavement. The 8 HP engine provides superior suction power and the BT-70 is agile enough to get it all.

For more information, call or write:

BILLY GOAT™ INDUSTRIES, INC.

You'll like the way they eat 'n run.

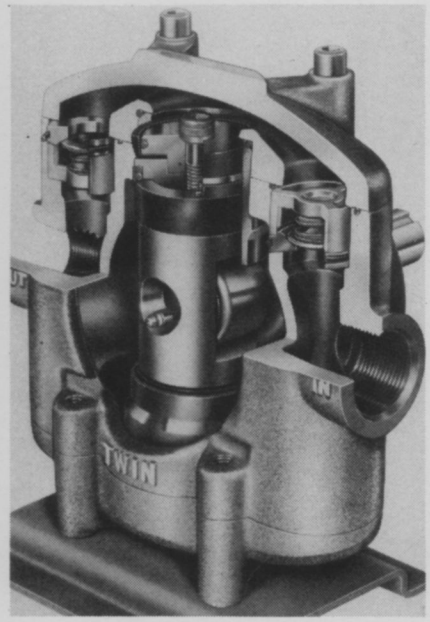
P.O. Box 308—1803 South Jefferson

Lee's Summit, MO 64063—(816) 524-9666

FSC 37 Contract Number GS-07S-01395

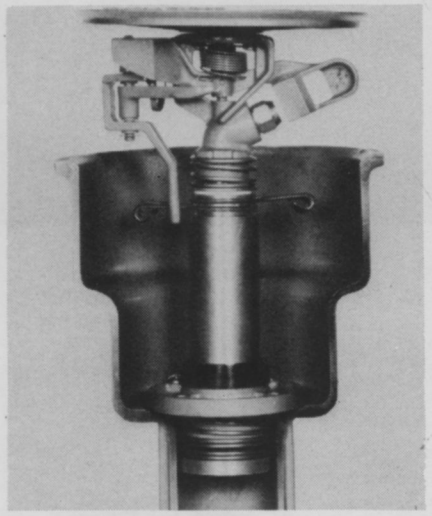
Circle 157 on free information card

Products



HYPRO, a division of Lear Seigler Inc., announces a new twin-piston pump. The unit, called the Series 5900 Super-Twin, is designed to operate at working pressures to 500 PSI. at 600 RPM (the maximum speed). At 500 PSI, the unit pumps 18.5 GPM. The manufacturer recommends chain coupling drive with in-line shafts. The pump can also be belt driven.

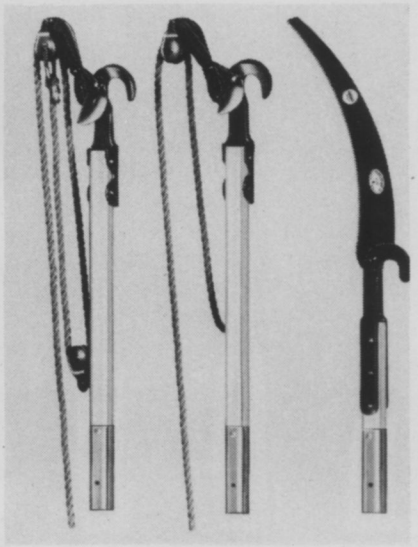
Circle 701 on free information card



Royal Coach Sprinklers, Inc. announces production of three new, one-inch female IPS, brass impact drive, rotary pop-up sprinklers with interchangeable nozzles for greater versatility and coverage.

The 10090 series sprinklers feature a one nozzle part circle model, a one nozzle full circle model, and a full circle model with two opposing nozzles. All three are equipped with an adjustable break-up nozzle and stream straighteners for greater distance and higher water pressure.

Circle 702 on free information card



Bartlett Manufacturing Co. is offering tree trimmer models with new drawn fiberglass handles. They will replace tree trimmers with laminated spruce handles which Bartlett has manufactured for many years. Both rectangular and round handles, with brass connecting sleeves, are available.

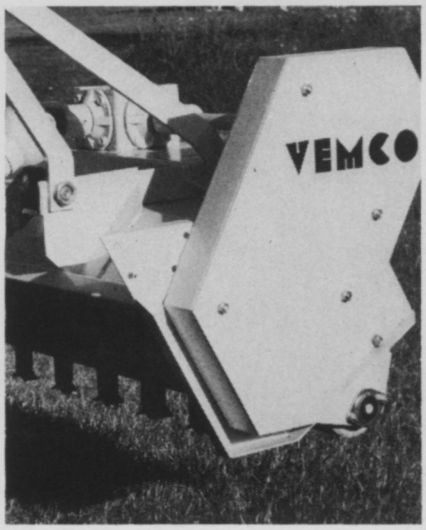
Section poles for extending reach up to 16 feet with rectangular models and up to 12 feet with round models are available. The extension poles can also be used with trimmer and with the wood handle units now in the field.

Circle 703 on free information card

The new Ross Super Tree Stake, a fast and easy method of delivering nutrients to trees, evergreens, and all shrubs, is announced by Ross Daniels Inc. This new Tree Stake is of a compressed formula of 16 percent nitrogen 10 percent phosphorous and 9 percent potash, plus trace elements of iron and zinc.

These stakes lend themselves to rainy season use, feeding while the soil is soft. One application of this pre-measured time release stake will usually supply enough plant food to trees for one year, a great savings in time, fertilizer and money for users.

Circle 704 on free information card



Vemco Flail Mowers is expanding marketing of flail mowers for use on tractors up to 35 hp, with a category "O" or category "I" three point hitch and a rear P.T.O. shaft. They are available in cutting widths of 42", 48", and 60", and are capable

Continued on page 53

ONCE OVER PRECISELY

FORD 335

Here's rugged, economical power for landscaping, snow removal, mowing, materials handling and other work. 44 net SAE horsepower Ford diesel or gasoline engine. A wide range of options let you tailor the Ford 335 to meet your needs and your budget; transmission and PTO options, differential lock, 3-point hitch/hydraulics, 5/8-cubic yard loader, tire options, etc. Count on your Ford tractor and equipment dealer for sales and service. He's listed in the Yellow Pages under "Tractor Dealers". See him soon.

Fast, precise landscaping. Ford 3-point hitch and hydraulics (optional) with twin lever controls. Response is smooth and accurate with fine increments of adjustment.

Digging power. 10-foot Ford backhoe (optional) handy for ditching, digging transplanting sites, constructing irrigation lines. Rugged, fast-working backhoe.

FORD TRACTORS

Circle 105 on free information card

Products

Continued from page 51

of cutting grass, weeds and brush up to three feet high.

The basic design uses a horizontal rotating drum with a number of lightweight, free-swinging knives, and a wrap-around housing for protection.

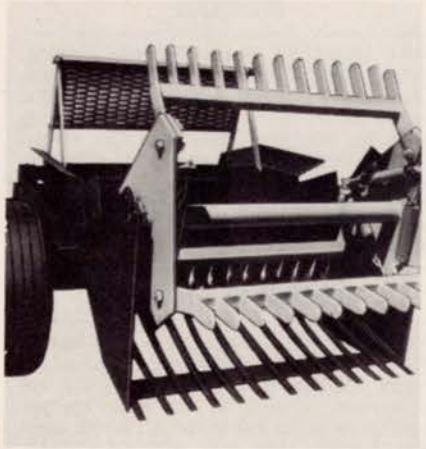
Circle 705 on free information card

The Toro Co., which entered the agricultural irrigation market two years ago with the acquisition of the Raincat center pivot system, has now introduced to that market the "Toro I," a highly versatile gear-driven sprinkler head.

The Toro I, with a basic body of tough Cycolac (ABS) which fits all standard agricultural irrigation systems, may be threaded directly to a riser without the need of coupling.

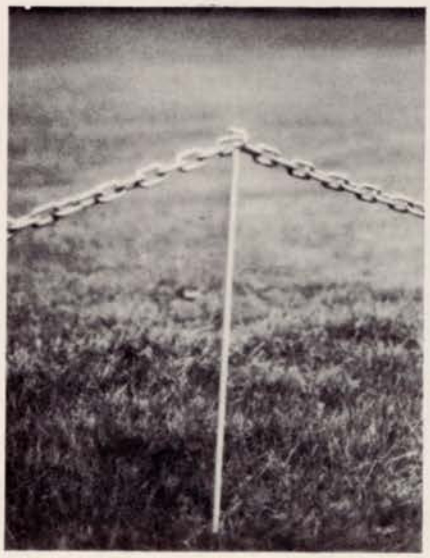
Circle 706 on free information card

Westgo Industries has introduced a Rotary Rock Picker that hauls nearly two tons of rock at one time. The rock picker handles rocks 2½ to 24 inches in diameter, has a capacity rating of 3500 pounds, and is designed so the operator can control from the tractor seat. The bucket and 50-inch wide fork work in-



dependently with a rope trip and selector valve.

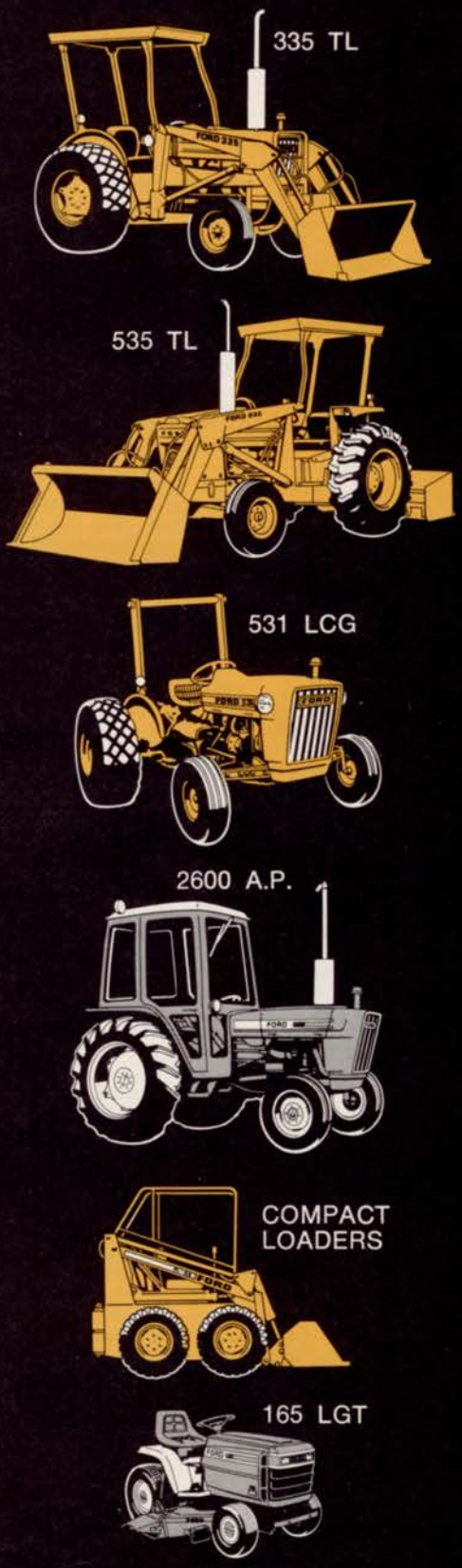
Circle 707 on free information card



Mercury Products has introduced a solid steel stake that costs no more than plastic stakes, and because of its durability, saves the additional costs of annual re-ordering. The Steel Stake is coated with a unique material that bonds itself to the steel and resists rust and scratches.

Circle 708 on free information card

Ford power for grounds maintenance



See them now!

Circle 106 on free information card

Classifieds

When answering ads where box number only is given, please address as follows: Box number, c/o Weeds Trees and Turf, Dorothy Lowe, Box 6951, Cleveland, Ohio 44101.

Rates: All classifications 50¢ per word. Box number, $1. All classified ads must be received by Publisher the 5th of the month preceding publication date and be accompanied by cash or money order covering full payment. Mail ad copy to: Dorothy Lowe, Weeds, Trees & Turf, P.O. Box 6951, Cleveland, Ohio 44101.

USED EQUIPMENT

FOR SALE: 2 used aerial baskets — 50 ft. working height, 2 Asplundh brush chippers. Bean sprayer, 35 G.P.M. Vermeer stump cutter 1560. Parkway Tree Service, Milwaukee, Wisconsin. Phone 414 257-1555.

FOR SALE: 1966 Ford F700 Skyworker with chipper box; 1971 Mitts and Merrill chipper 16" feed; F350 Ford with chip box and side tool boxes. John Mayer TreeCare. 707 459-2013.

SEVERAL 50 FOOT SERVI-lifts mounted on GMC trucks. Call 401 725-2250.

FOR SALE — 1975 Vermeer Ts-22" tree spade. Mounts on Bobcat or 3 pt. hitch. Excellent condition. $1800.00. 1976 Care tree 30" tree spade. Mounts on Bobcat or 3 pt. hitch. Mint condition. $2995.00. 1976 Care tree 36" tree spade. Mounts on 990 Bobcat, tractor, loader, or dozer. Mint condition. $4495.00. 1972 Vermeer TS-44T tree spade on 1974 GMC 1 ton. New spades. Good condition. $7800.00. Will send photographs upon request. Call or write: Spartan™ Tree Transplanting Equipment Company, 16084 S. Chandler Rd., East Lansing, Michigan 48823. Phone 517 351-1370. (We buy, sell, and repair high quality tree transplanting equipment).

1970 HIRANGER mounted on 1970 F-600 Ford truck with chip box and side tool boxes. Very good condition, $22,500.00. 1974 HiRanger mounted on 1974 F-600 Ford truck with chip box and side tool boxes. Very good condition, $28,500.00. Clearing Nicolas mulcher, can be attached to hydro-Ax or 3 point hitch on tractor, $5,500.00. Osborne Tree Service, Mentor, Ohio 44060. 216 255-9109.

LANDSCAPE EQUIPMENT FOR SALE — 800 gallon Finn hydro-seeder, like new $5,-200.00; new 8' York rake, $800.00; Gill pulverizer with seeder, $700.00; Finn straw blower, $1,500.00; 1968 Ford F-350 truck with 12' steel bed and new hoist, $2,800.00; 10' lime or fertilizer spreader $250.00. Lester's Landscaping, Fairborn, Ohio. 513 864-2138.

TS-66T VERMEER Tree Spade on 1973 GMC 6500 V-6. 2 speed rear end with positive traction — 5 speed transmission — 3700 actual miles. Better than a new machine. Call: 318 281-5596 days; 318 281-7849 nights.

FOR SALE Waynes Brush Chipper, 16 inch, less than 1000 hours, perfect shape. Klausing Tree Service, New Lenox, Illinois 60451. Phone 815 485-8488.

ROTOMIST BEAM TREE SPRAYER, model No. 100F-100. Skid mount. 100 gallon tank, used very little. Good running condition. $4,200.00. Call 203 537-2933.

VERMEER TS44T on 1969 Chev. C50, ready to work, pictures and price on request. 208 664-5914. 821 4th St., Coeur d'Alene, Idaho 83814.

HYDRO-AXS FOR SALE. Price range $22-$30,000. Excellent condtion. Call Jeff Gould, 203 767-1636, P.O. Box 178, Essex, Conn. 06426.

FOR SALE: 7 gang Roseman Mower $1350. Foulkes Sod Farm 414 484-3941.

1974 VERMEER TS-44A. Excellent condition, moved only 200 trees. 317 665-3851.

SEEDS

SOD QUALITY Seeds Merion, Fylking, Delta, Park, Newport, Nugget, Adelphi, Cheri, Glade and Baron bluegrasses also fine fescues. Manhattan rye grass. Custom mixing available. Michigan State Seed Co., Grand Ledge, Michigan 48837. Phone 517 627-2164.

SEEDS, TROPICAL. Bulk orders. Call SS 305 278-6004, One Southeast 4th Ave., Suite 208, Delray Beach, Fla. 33444.

HELP WANTED

YEAR ROUND WORK A.A.A. Tree Service, Inc. of Florida. Looking for experienced top notch climbers with or without truck and equipment to work by the hour, on percentage or under Franchise in Florida areas. Also needed older men with sales ability. Mechanic with chain saw experience. Man to operate his own tree spade. Henry Hardy, Jr., P.O. Box 6173, Orlando, Fla. 32803. Phone 305 339-5242.

PARK SUPERINTENDENT The City of West Bend is accepting applications for a Park Superintendent who will be responsible for the maintenance of all City parks, recreation facilities, parkways, boulevards, nursery, and City forestry. Candidates must have had supervisory experience in these areas with a degree based on Park Administration or a related field such as horticulture, forestry, or conservation. Starting salary will be $1,166.00 to $1,291.00 per month — depending on qualifications. Liberal fringe benefits provided. Applications will be accepted until position is filled. Send resume to Personnel Director, City Hall, 100 N. Sixth Ave., West Bend, Wis. 53095.

INSTRUCTOR/ASSISTANT PROFESSOR PLANT SCIENCE: Teach horticultural courses such as Nursery Operations, Landscape Construction, Turf Management and Plant Identification and Utilization. Possibility of evening and summer teaching. Assist in arranging summer work experience for students. Qualifications: Master Degree in Plant Science with strong leaning toward practical applications. 5 years of commercial or other field experience in plant science. Characteristics: mature, conscientious, imaginative, creative & demonstrated leadership potential. Application deadline, 4/15/77, position begins 9/1/77. Contact Dr. Lewis Roberts, Jr., Thompson School of Applied Science, Barton Hall, University of New Hampshire, Durham, N.H. 03824. The University is an Affirmative Action/Equal Opportunity Employer.

ASSISTANT SUPERINTENDENT or Grounds Foreman, attractive memorial gardens located in North Midwest has an excellent opportunity for an experienced assistant superintendent or a grounds foreman. Applicant should have a minimum of five years cemetery experience and at least two years in a supervisory position. All inquiries strictly confidential. Please send resume to Box 160, Weeds, Trees & Turf, Box 6951, Cleveland, Ohio 44101.

PERSONS WITH HORTICULTURAL, entomology and agronomy backgrounds or related practical experience to fill position as management trainees to learn the mechanics of our lawn spraying and general household pest control business for our branch office in Maine. Send resume (held in confidence) to Collins Insect Control, Inc., B.D. Collins, Pres., P.O. Box 998, Boca Raton, Fla. 33432.

LANDSCAPE-DESIGNER/SALESMAN. Landscaping Nursery specializing residental-commercial projects has permanent position available for person with experience, ambition and reliability. Must have plant knowledge and good design ability with positive sales technique. Immediate opening. Send resume to Francisco Tavares, Inc., P.O. Box 231, East Falmouth, Mass. 02536. Phone 548-0911.

INDIVIDUAL WITH EXPERIENCE in utility right-of-way tree and brush work. Middle management position to supervise spraying, trimming and clearing crews. Must be willing to travel. Call or write Chem-Trol, Inc., P.O. Box 2343, Kansas City, Kansas 66110. 913 342-3006.

SOD

TISCHLER ZOYSIA GRASS FARM, 4206 Medical Parkway, Austin, Texas 78756.

NOTICE OF CHANGE IN RATES

Effective June 1, 1977, classified advertising in WEEDS TREES & TURF magazine will be 65¢ per word.

NEW DEADLINES & PUBLISHING DATES

Effective with January, 1977 issue our classified pages will close and issues will mail on the following schedule:

Orders and copy are due 5th of month preceding issue date.
Publication mailed the 27th of each month.

As in the past, our policy is cash or money order covering full payment with order.

We're pleased to have served you in the past and look forward to being of service to you again in the future.

FOR SALE

SEWAGE TREATMENT PLANT — two 11,000 gallon units in series. Can be used singly. Plant was operating until municipal system was employed. Bargain price of $12,-000.00 or will trade for used mobile homes or "what have you". Mayo Mobile Homes, Trexlertown, Penna. 18087.

BUSINESS OPPORTUNITIES

EXCLUSIVE FRANCHISE AVAILABLE to the right person. Requirements — 100 to 300 acres of good farm land. One or two people willing to learn and work. Payoff — a competitive advantage in the growing lawn grass sod market. We know the business and are looking for winners only! Beck Mfg. Co., P.O. Box 2014, Auburn, Alabama 36830.

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please correct your mailing label

For FASTEST service attach old mailing label in space below.

If mailing label is not available, print your old company name and address in this box.

Please allow 6 weeks for change to take effect.

Print your correct name, title, business address, and/or other corrections.

NAME _____

TITLE _____

COMPANY _____

ADDRESS _____

CITY _____ STATE _____ ZIP _____

CHECK HERE ☐ if you want to continue receiving WEEDS TREES & TURF Magazine.

IMPORTANT: You must sign below.

Signature _____ Date _____

Mail to:
Circulation Manager
WEEDS, TREES & TURF
9800 Detroit Avenue
Cleveland, Ohio 44102

There is one sure way to keep a consistent moisture level on your tees, fairways and greens.

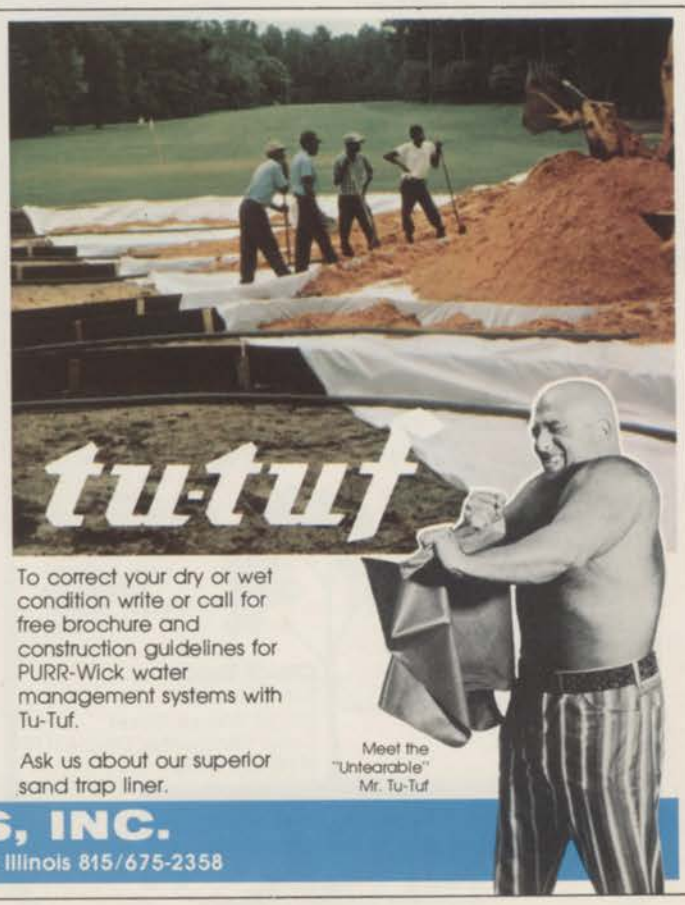
Install a PURR-Wick water management system using . . . tu-tuf CROSS-LAMINATED POLY SHEETING

By building your tees, fairways and greens over Tu-Tuf barrier liners, you will have total control of the moisture content. Water will be contained during dry weather and will soak through and be drained out during heavy storms.

You will save water, fertilizer, labor and cut maintenance costs significantly. Construction costs are about 1/2 that of traditional designs.

Why is Tu-Tuf so important?
Tu-Tuf is cross laminated adding strength, flexibility and durability over standard poly sheeting.

Tu-Tuf . . .
▪ has up to 10 times the water-vapor transmission rate ▪ will not crack in folds and creases ▪ is pin-hole free ▪ has superior resistance to snags and punctures ▪ is weather stabilized, will not rot or disintegrate ▪ is made to specifications while standard poly has length and width limitations.



To correct your dry or wet condition write or call for free brochure and construction guidelines for PURR-Wick water management systems with Tu-Tuf.

Ask us about our superior sand trap liner.

Meet the "Untearable" Mr. Tu-Tuf

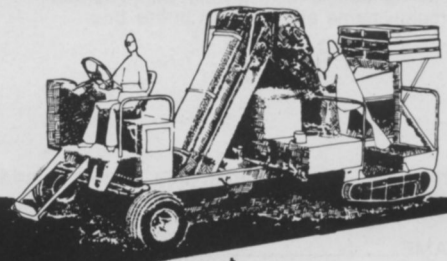
STO-COTE PRODUCTS, INC.
Richmond, Illinois 60071 • Call Toll Free 800/435-2621 • In Illinois 815/675-2358

Circle 141 on free information card

Our Customers Insist

Princeton's "Self-Propelled"

Sod Harvester is Unbeatable!



Richard P. Jenks, President
REDETURF, INC.
Hubbard, Oregon

"Redeturf personnel have experience with all commercially available sod harvesters and we feel the Princeton method is the best. We have used the Princeton "Self-Propelled" since 1968 and have cut our labor force enough to pay for several machines."

David W. Picha, General Manager
EMERALD TURF GRASS FARMS
Sumner, Washington

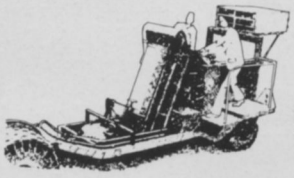
"We harvested over 20 million square feet of sod with a Princeton "Self-Propelled" before the first overhaul."

Stanley F. Cruse, Vice Pres./General Manager
PURSLEY TURF GRASS
Palmetto, Florida

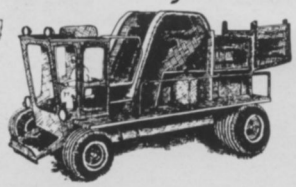
"Harvesting quality turf grass requires quality equipment. That's why we use Princeton."

Our customers say it best. Increase your profits...by reducing costs and increasing production. Three man crew can harvest 22,500 sq. ft. of sod per hour with Princeton's "Self-Propelled" Sod Harvester.

There's a Princeton for Everyone.



Designed to meet the special needs of the smaller volume sod producer. Operates behind any adequately sized, low speed tractor. Exclusive "2 minute hook-up" capability allows complete flexibility in the use of your power supply. With a 3-man crew, harvest up to 13,500 sq. ft. of sod per hour...palletized, ready to ship. The "Tow Boy" Sod Harvester...a *real* Princeton at one third the cost of our larger machines.



The only sod harvester that does it all...with just one man! Cuts, aerates, crosstie stacks, and palletizes 27,000 sq. ft. of sod per hour with a crew of one. Save time, money, and man hours. For the large volume sod producer who wants to increase production *and* profit. The Princeton "Automatic" Sod Harvester.

For additional information write or call collect:

Chuck Braun
Sales Manager
955 W. Walnut Street
Canal Winchester, Ohio 43110
(614) 837-9096

PRINCETON
MANUFACTURING COMPANY

Circle 142 on free information card

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The Jacobsen 70″ Triplex trims close like a hand mower, mows fast like a riding mower.

Here's the most maneuverable and versatile little riding mower you've ever laid eyes on. Small but powerful. It's driven by a full 8 HP engine.

Without leaving the seat you can trim close around trees and under low-hanging shrubs and tree branches. And cut a hefty 70″ swath at the same time.

Reels come equipped with either skids or rollers. Large capacity catchers are optional.

In fact, you can reach all the controls from the driver's seat, including the key switch, starter, choke, throttle and reel drive clutch.

Without taking your hands off the steering wheel, you can speed up or slow down, and go forward or in reverse. It's all done with only one foot pedal, and our advanced hydrostatic transmission. A feature you'll only find with Jacobsen for this type of unit.

Here's another Jacobsen exclusive. The reel speed is independent of the mowing speed. Which lets you put a beautiful crew cut finish on any turf.

Want to change cutting height? Easy. All you need is a wrench.

And, the 70″ Triplex Trimmer is the only mower of its type to meet the American National Standards Institute, Inc. (ANSI) safety standards.

The mowers are fully articulated so they hug the contours of uneven ground.

Ask your Jacobsen Distributor for a demonstration of the biggest little riding mower on wheels.

Take a look at leadership.

Jacobsen Manufacturing Company, Racine, Wisconsin 53403

JACOBSEN.

An Allegheny Ludlum Industries Company

Circle 150 on free information card

"One crew grows our sod, another crew lays it at the customer's home or place of business...Both crews have their own reasons for preferring

baron* Kentucky Bluegrass."

John Hoerr of D. A. Hoerr & Sons, Peoria, Illinois.

D. A. Hoerr and Sons, Peoria, Ill., raises 500 acres of sod and lays much of it through their Landscape Contractual Division at commercial, industrial, municipal and homeowner sites. James Hoerr says: "Since we began using Baron Kentucky Bluegrass, we've had less problems raising a good quality sod and even fewer problems after the sod is laid. We can't just sell sod and hope for the best. We're responsible, even after installation. We find it pays to start with the very best seed we can buy. Baron gives us a well knit sod that takes root quickly, cutting down on service calls".

"When it comes to marketing sod, I can do it faster with Baron. John Hoerr says, "Baron's fast germination and quick development into mature sod shortens the time between planting and the day I sell my sod. In the sod growing business, that means money in our pockets."

"We use a blend of 3 bluegrasses with a minimum of 50% being Baron Kentucky Bluegrass. The other two varieties are Majestic and Merion. The high percentage of Baron insures us of what we consider to be our safety factor."

"Since we have been putting Baron in our mixture, we find the overall color holds up with less fertility. I use less fertilizer with Baron in the mixture than I have with any other bluegrass mixtures."

"All of our sod is mechanically harvested so it's important that root development is rapid and our sod holds together well. Baron lets us keep our fields clipped close and roots seem to knit well, giving us less hauling and handling problems. In our Landscape Contract and Maintenance Contract Servicing Departments, we know in advance complaints from the end user will be minimal."

If you're a sod grower, golf superintendent, or a professional landscape contractor, top quality turf is important to you. Lofts is ready to help with Baron, Majestic or Touchdown Kentucky Bluegrasses, Jamestown Chewings Fescue, Yorktown and Diplomat Ryegrasses as well as other varieties.

LOFTS

Lofts Pedigreed Seed, Inc.

Bound Brook, N.J. 08805 / (201) 356-8702

Lofts/New England
20 Beck Road
Arlington, Ma. 02174
(617) 648-7550

Great Western Seed Co.
Box 387
Albany, Or. 97321
(503) 926-2636

Lofts/New York
4294 Albany St.
Albany, N.Y. 12205
(518) 456-0042

Loft Kellogg Seed Co.
322 E. Florida St.
Milwaukee, Wi. 53201
(414) 276-0373

(Canadian Baron Dist.)
Oseco Limited
Box 219, Brampton
Ontario, Canada
(416) 457-5080

*U.S. Plant Patent #3186, Dwarf Variety

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